American Gas Association MONTHLY

New Theory of Fuel Formation

•

Gas Development in the East

•

New Orleans Air Conditioning

•

Selling Volume Water Heating

•

Ammonia as a Purifying Aid

October 1940

VOLUME XXII NUMBER 9

"NOTHING CAN TOUCH IT FOR FLEXIBILITY!"

"ACTUALLY DOES MORE COOKING ON LESS FUEL!"

"IT HELPS YOU TURN OUT MORE DELICIOUS MEALS!"

"THE NEW GAS RANGES ARE THE LAST WORD IN BEAUTY!"

Why 3 out of 4* women now choose GAS for modern Automatic Cooking

★ This ratio is approximate for the country as a whole. It is actually much higher in communities enjoying gas utility service. It applies to all ranges using automatically delivered fuel.

What would make 3 out of 4 women choose modern Gas ranges—when they could have any kind they want?

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If you want the ultimate in a Modern Gas Range, see the new Certified Performance models. Whatever make you buy, the CP Seal assures your getting all the 22 super-performance standards established by the Gas Industry.

AMERICAN GAS ASSOCIATION

LET GAS DO THE 4 BIG JOBS—COOKING • WATER HEATING • REFRIGERATION • HOUSE HEATING

Second gas range ad in the new 1940-41 series which will appear in national publications starting in November and continuing through January issues

American Gas Association MONTHLY

CONTENTS FOR OCTOBER 1940

There's still time to toss an extra shirt into your suitcase and take a fast train to Atlantic City. That great American institution—the convention—is the headline attraction and it offers a four-star program of men and events. . . . So much is heard about Texas and California gas fields that the Appalachian area is sometimes neglected. Prof. Price sets the record straight with impressive facts and figures. . . . Revolutionary is the word for Dr. Berl's new theories on the origin of gas, oil and coal. He topples many previous conceptions and throws new light on nature's work. . . . The industrial South is straightening out the kinks in the climate with gas summer air conditioning. At least New Orleans is doing mighty important work in this direction. We present full details on five outstandingly successful jobs. . . . Those sharp gains in the Brooklyn sales curves weren't all due to the World's Fair, Mr. Paige points out in an inspiring article. Sound and aggressive sales promotion is the answer. . . . It's a strange world! The masculine element has gone in for cooking in a serious way. Miss Kirtland tells why. . . . More about that big juicy customer—the Government—from our Washington expert, George Bean.

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Courtesy *Niagara Hudson News*

Gas compressor that can pump one million cubic feet of gas per hour at 15 pounds pressure from the holders into the distribution system at Syracuse, N. Y. Only one of the four cylinders in the compressor is shown in the picture

American Gas Association MONTHLY

JAMES M. BEALL, *Editor*

THE AMERICAN WAY
. . . There's Something About a Convention

THIS year when the whole fabric of American life is being influenced strongly by world conflicts which are raging, the annual convention of the gas industry is more significant than ever. When the delegates meet in Atlantic City from October 7 to 10, they will take part in one of those time-honored and peculiarly American institutions—the convention. Probably no place else in the world have there been as many or as fruitful conventions as in North America. Probably no place else today could such meetings, typical of democratic processes, be held.

The gas man today knows that he lives in a critical period. He knows that the world is undergoing rapid and drastic changes. He knows too that the gas industry will be affected by these changes. He wants to know more about the industry's part in national defense; more about his own job and his prospects for security in these unsettled times. The quickest and best way for him to find out, first hand, is to attend this convention.

•

The convention offers an unexcelled opportunity to the individual. In the short space of four days, he can absorb the results of months of planning by the industry's leaders. He can enjoy the unmatched privilege of contact with experienced veterans in every field. He can get the inspiration that always abounds at these gatherings.

Speakers on a wide array of subjects, all keyed to the gas industry and its problems, will take part in the program. Such men as Dr. Harold G. Moulton, president, The Brookings Institution; John Benson, president, American Association of Advertising Agencies; Allan M. Pope, president, the First Boston Corporation; Elmo Roper, *Fortune* Magazine, and others equally as distinguished, will give outside viewpoints on the gas industry's place in national affairs.

New speakers on the general sessions' program, announced since the last issue of the MONTHLY appeared, are Dr. Harvey N. Davis, president of Stevens Institute of Technology, and F. C. Smith, president, Houston Natural Gas Company, Houston, Texas. A noted educator and trainer of technical men, Dr. Davis has much to offer the convention. Mr. Smith, who made a stirring address on Fundamental Research at the last A. G. A. Convention, will bring this important subject up-to-date.

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While the program recognizes the new and pressing problems arising from international issues, it has not forgotten that the average gas man is more than ever concerned with his own job. How can it be done better? is the thought uppermost in his mind. In answer to this industry-wide quest for specific aids and helps, the sectional programs get down to individual cases on scores of practical operating problems.

The accountant, the advertising man, the salesman, the engineer, the home service worker and the industrial gas man, each has available a program which meets the test of the times—a program that gives him something tangible which he can use to cope with present-day problems. In a word, it is a program built to order for the individual, yet comprising a consideration of the most vital national issues before the industry today—issues that are the personal concern of every progressive thinker in our business.

Detailed copies of the advance convention program and other information have been distributed to all members of the Association. But this outline of events cannot convey the full importance of the convention. It cannot account for the scores of individual problems which are solved directly by an interchange of ideas in informal discussions of mutual problems. Such an exchange of ideas brings values which cannot be measured in a test tube or registered on an adding machine.

Natural Gas . . . *Its Recent Development in the Appalachian Area*

By PAUL H. PRICE

State Geologist
Professor and Head, Geology Department, West Virginia University

THE Appalachian area as here considered consists of the five States, New York, Pennsylvania, West Virginia, Ohio, and Kentucky. (Figure 1) It is recognized I believe as the birthplace of the oil and gas industry, and has certainly been the most important natural gas producing area in the world. The value of the gas produced and marketed from 1897 to 1937 amounted to approximately four billion dollars or nearly one-half the value of gas produced in the United States for the same period.

This area has produced over 99 per cent of the gas it has consumed, and consumed over 99 per cent of the gas it has produced. Since 1931 an appreciable amount of the gas produced in the area has been exported to Maryland, the District of Columbia, and Virginia, and the consumption figures in these areas have been included in the statistics. The small amount of gas annually exported from the area to Canada, Illinois and Indiana, however, is not considered in the following discussions.

The exact mechanics of the origin of oil and natural gas is not generally agreed upon, and I have no thought of answering it finally here. I am pleased to report, however, that the work of the West Virginia Geological Survey is taking its place along with basic research carried on by other public and private agencies.

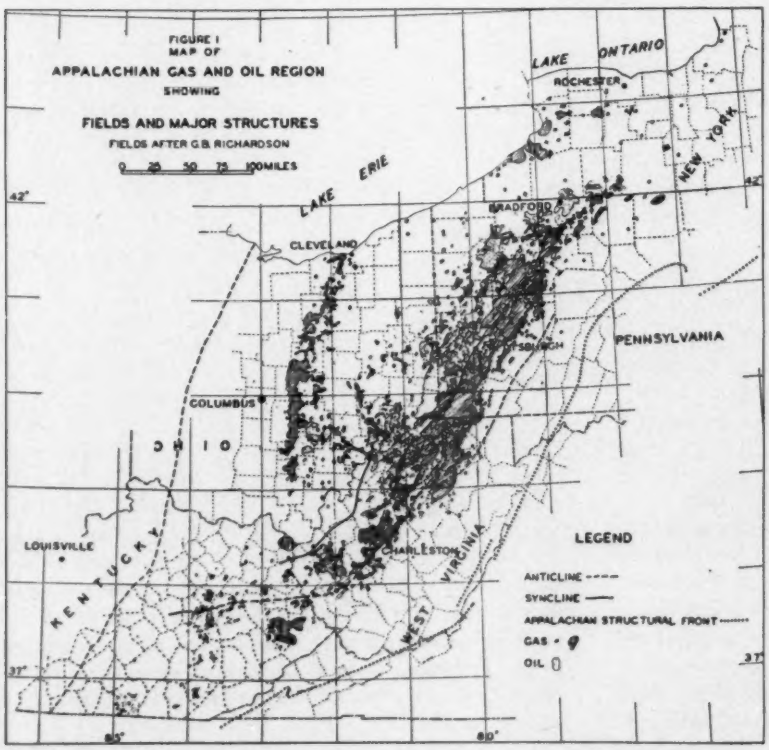
Perhaps the greatest handicap in understanding the method of formation and source of oil and gas is our inability to determine the various compounds that are present in the source material and in oil and gas. Progress is gradually being made, however, and our Survey has recently published the results of several hundred detailed analyses of natural gas in the Appalachian area.[1] These results gave some of us a new conception of the distribution, both geologic and geographic, of the respective constituents of natural gas in a single geosynclinal area, as the Appalachian area is.

Vast Resources Developed

Until about 1893 the volume production of natural gas was largely confined to the vicinity of Pittsburgh, Pennsylvania, and Findlay, Ohio, with each state furnishing its own source of supply. However, the solving of the mechanical difficulties of transportation and marketing now permitted the development of the vast gas resources that had been discovered in connection with the search for oil in West Virginia.

By 1906 the production and marketing of natural gas in the Appalachian area had entered upon the intricate inter-state phase that we know today. The total market, however, continued to grow until 1916 or 1917, at which time the domestic market was essentially stabilized, but the industrial market decreased sharply.

Figure 2 shows the production of gas marketed by states for the Appalachian area from 1906 to 1938. In 1906 (the first year that detailed volume statistics are available) West Virginia was producing 40 per cent of the total production of the Appalachian area. In 1909 West Virginia produced more



Abstract of paper presented at Appalachian Gas Measurement Short Course, Morgantown, W. Va., Aug. 19-23, 1940.

[1] Vol. IX, Physical and Chemical Properties of Natural Gas, W. Va. Geol. Survey (1937).

gas than any other Appalachian state, and has since remained in first place. During the years 1909 to 1923, inclusive, West Virginia produced more gas than any other state in the Union. In 1924, however, West Virginia lost that distinction to Oklahoma, and in 1937 Texas, California, Louisiana, and Oklahoma each produced more gas than West Virginia, ranking nationally in the order named.

The peak of West Virginia production was reached in 1917, and less gas was produced in this State in 1933 than in any year since statistics on volume production have been kept (1906). Following the low point in 1933, West Virginia production increased until 1937. Preliminary figures indicate that production fell off in 1938 but increased again in 1939. West Virginia's gas production is the only one that closely parallels the total production of gas in the Appalachian area, which is probably due to the fact that West Virginia is the one consistent exporting state in the area.

Production Stable

The production curves for the other Appalachian states are unusual in that they show very few noticeable peaks or valleys. Pennsylvania's production dropped in the early twenties, and again in the early thirties, and Ohio's production was reduced slightly for the same periods, but even the depression years showed little effect in the Kentucky and New York production. While the development of large reserves of gas in the Devonian shales in Kentucky is probably the cause of the sharp rise in that State's production in 1928, few other changes in the volume production of gas in any state can be ascribed to the finding of new fields.

The heavy line (Figure 2) shows the total production of natural gas in the Appalachian area. The shape of the curve emphasizes the dominant role played by West Virginia production. The production and consumption of natural gas in the Appalachian area are practically identical, and from the shape of the production curves shown (Figure 2), it would seem that

[2] Compiled from the reports of the U. S. Weather Bureau.
[3] Compiled from data of the Bureau of Business Research of the University of Pittsburgh.
[4] Compiled from data in the Minerals Yearbooks of the U. S. Bureau of Mines.

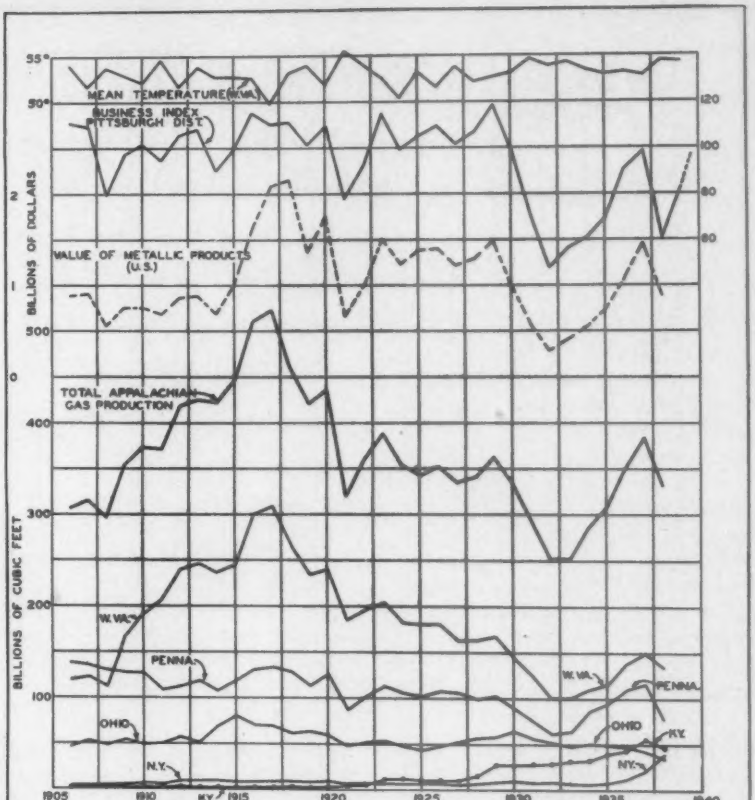


FIGURE 2. APPALACHIAN GAS PRODUCTION 1906–1938

West Virginia production has, in the main, absorbed the fluctuations of demand for the entire area.

It may not be generally recognized to what extent economic conditions control the volume of gas production. Long time storage of gas above ground has not been feasible, and as a result, it seems that it is the market and not the ability of the wells to produce, that controls the total yearly production in the Appalachian area. To be sure, the pressure of exceedingly large potential production, backed by the *adequate reserves*, will cause new markets to be sought for. This latter effect is indicated prior to 1917, and possibly again in the middle and late thirties. It must be remembered, however, that pipelines are costly, and it is the gas that can be marketed over a period of several years, not one year, that pays for those lines.

To better illustrate the effect of various factors on the production of gas, three additional curves have been added. (Figure 2.) The upper curve is the yearly mean temperature of West Virginia.[2] There may be a general but inexact similarity between the peaks and valleys on this curve, with those on the curve for the total gas production. While the temperature is *very* important in determining peak loads, it is not a determining factor in the wide variations of total annual gas production.

The second curve from the top (Figure 2) shows the yearly business index for the Pittsburgh district.[3] Here, this is a marked similarity with the curve showing total gas production. All major peaks or valleys on one curve are present on the other.

The third curve from the top (Figure 2), showing annual total value of the metallic products of the United States, was added to further illustrate this point.[4] This curve closely parallels that for the total production of natural gas in the Appalachian region. This fact is the more striking when it is remembered that the Appalachian region produces practically none of the

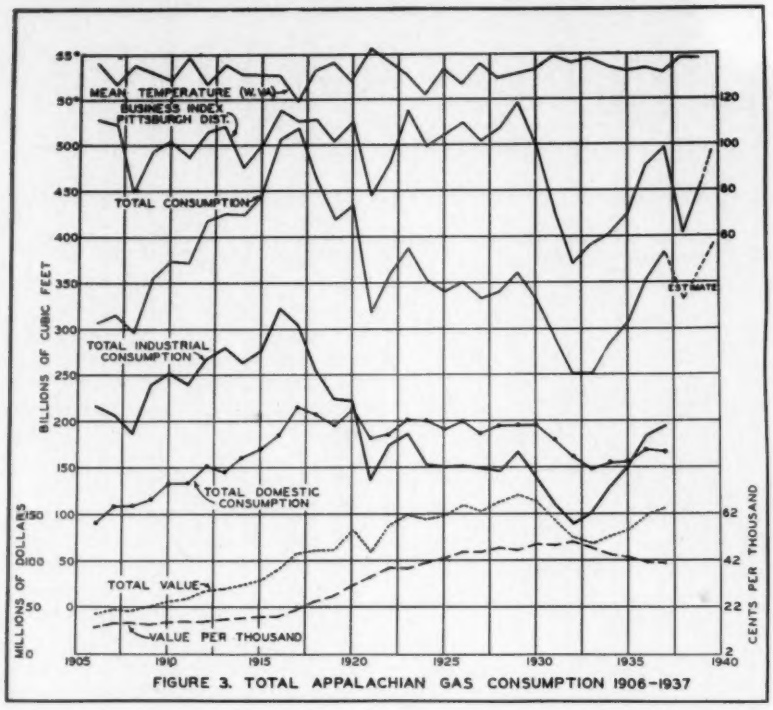


FIGURE 3. TOTAL APPALACHIAN GAS CONSUMPTION 1906–1937

ore for these products. While a large part of the iron ore is smelted in the area, the curve includes the value of gold, silver, copper, lead, etc., none of which are produced or smelted in the Appalachian gas region. While the steel industry is *one* of the large industrial consumers of gas, it is far from being the only important one.

Economic Factor

It seems, therefore, that the volume of gas production in the Appalachian area is closely related to the economic conditions of not only the district, but also of the nation.

From the preceding discussion it is seen that industrial activity is an important factor in the volume production of gas. Figure 3 will illustrate this in another way. The heavy line shows the volume of gas consumed by industry in the Appalachian area since 1906. The rapid decline in industrial gas consumption accounts for almost the entire decrease in consumption of gas following World War I.

Domestic consumption of gas exceeded industrial consumption from 1921 to 1935. While the industrial consumption accounts for most of the yearly variations in production, domestic consumption also plays a part. A comparison of the domestic curves and temperature curve suggests some correlation of "highs" and "lows." Temperature variations, however, can not be the cause of the major drops in domestic consumption in the depression years of the early twenties and early thirties. The amount of income also affects the domestic consumption of gas. In this regard it is interesting to note a lag of one year between changes in the domestic and industrial curves indicating that the consumers' income is important in domestic consumption.

This figure also shows the yearly value of gas produced and marketed in the Appalachian area (figured at the points of consumption). Also shown is the average value of the gas per thousand cu.ft. (at the point of consumption). The price increase from 1916 to 1921 may be accounted for in part by the sharp decrease in industrial consumption.

Figure 4 shows the net exports and imports of natural gas from or into each of the five Appalachian States. The exports are shown above the zero line and the imports are plotted below this line. Detailed statistics are not available prior to 1906, but from that date until 1928 West Virginia was the only State that produced more gas than it consumed. Since 1928 both West Virginia and Kentucky have exported gas. At the top of Figure 4 the percentage of West Virginia's production that has been exported has been plotted. As shown, West Virginia has exported over fifty per cent of its yearly production since 1906, the first year for which statistics are available. This figure also illustrates that West Virginia has absorbed the fluctuations in the demand for natural gas.

Recent Trends and Developments

In 1937 (Figure 3) the volume of domestic gas consumption had not recovered entirely from the depression low of 1933. This market may be expected to increase.

Perhaps the most remarkable recent trend is the rapid increase in the industrial consumption of gas since 1932. If the deep drilling in the Appalachian area continues to be successful, this part of the market may continue to expand, even though in 1937 it was already well above the level of the twenties. The index of business activity indicates the production for 1939 should be more than 1938, but slightly less than 1937. The index for the first half of 1940 indicates that the production this year will exceed that of 1937, and may exceed that for any year since 1920.

On Figure 5 has been plotted the recent trends in the treating of natural gas for the recovery of gasoline since 1926. The quantity of gas treated for gasoline is expressed as a percentage of the production of each State. The

(Continued on page 367)

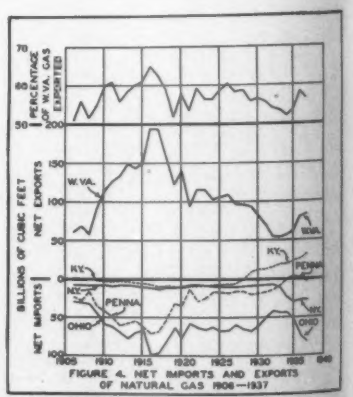


FIGURE 4. NET IMPORTS AND EXPORTS OF NATURAL GAS 1906–1937

Dr. Berl

Formation of Fuels . . .

A New Theory of the Origin of Gas, Oil and Coal

By Dr. E. Berl

Research Professor, Carnegie Institute of Technology, Pittsburgh, Pa.

Our research work has shown that, depending on the raw material, local conditions such as alkalinity of the mother rocks like limestone and dolomite, pressure and somewhat elevated temperature, gaseous, liquid, and solid fuels can be formed from those carbohydrates. It has been shown that during this process of intramolecular combustion from a raw material which contains roughly 50% of oxygen material with less oxygen, or none at all, is formed. Carbon dioxide and water, furthermore oxygen-containing materials like acids and alcohols, are formed at the same time. We have found that methane and homologues not only are formed by fermentation of carbohydrates, but they are also formed during all those stages of conversion of those parent materials rich in oxygen until one gets practically oxygen-free substances in form of gaseous, liquid, and solid hydrocarbons.

- **The gas and oil industries have always been vitally concerned with the actual mechanism whereby gas, oil and coal were formed. Last month before the American Chemical Society, Dr. Berl tumbled many of the previous theories overboard.**
- **He has reproduced in the laboratory the formation of the basic fuels, not as a means of making gas, oil and coal artificially but to show how all plant material and waste which might contain carbohydrates could be converted into fuels. As the New York *Herald Tribune* expressed it: "What the Wrights did to distance, Dr. Berl has done to geologic time."**
- **The accompanying abstract was written especially for the A. G. A. MONTHLY.**

NATURE has put at the disposition of mankind great riches in natural gas, liquid and solid fuels. It was formerly believed that natural gas with different composition, but mostly containing methane and in some cases its homologues and larger quantities of carbon dioxide, was formed by the fermentation of organic material mostly cellulose and other carbohydrates. It was believed that liquid fuels of a very complex composition but containing aliphatic, hydroaromatic and aromatic hydrocarbons were formed at rather high temperature from fish which were killed by geological catastrophes.

It was believed furthermore that the solid fuels derived largely from the lignin part of the plants and that the carbohydrate part was destroyed by fermentation or transformation into water soluble sugars. It was stated that there is a transition from woody material over peat, lignites into bituminous coals and finally anthracites.

The new studies show that these and other viewpoints are wrong. It has been found by experiments carried out under geochemical possible conditions that at higher temperature most of the gaseous, liquid, and solid fuels are formed by the decomposition of carbohydrates which nature forms to the largest extent from carbon dioxide and water of the atmosphere under the influence of chlorophyl as a catalyst—this with a photochemical reaction until now not completely explained.

It has been found that only lignites and fusains are derived from the lignin part of the plants. Lignites exist which contain larger amounts of carbohydrate derivatives which change their caking qualities. Provided those lignites do not contain large amounts of carbohydrate derivatives, they always form sandy coke because lignin and its derivatives do not form large quantities of bitumen (soluble in certain organic solvents). Bituminous coals, contrary to lignites and fusains, do not show any vessel structure and do not contain methoxyl groups. There is no possibility to transform in nature or in the laboratory lignites poor in carbohydrate derivatives by aging through pressure and temperature into bituminous coals.

If during a certain transformation of carbohydrates, neutral or slightly acid reaction existed, coal-like material is formed which like certain bituminous coal in nature gives sandy coke. If during this same transformation an alkaline reaction prevailed, bituminous coals are formed which like certain natural bituminous coals give excellent hard or porous coke. The bituminous coals are composed of residual coal and of bitumen. Residual coal is insoluble in organic solvents and alone always forms sandy coke. During the caking process those particles are cemented by the decomposition products of a bitumen which decomposes before it distills off.

If during the first transformation of carbohydrates the quantity of alkali is increased, then the formation of resid-

ual coal can be completely suppressed. Only bitumen (protoproduct) then is formed which through further intramolecular reaction loses oxygen and forms asphalts. Those asphalts by further intramolecular reaction which is a kind of a special cracking process, or by hydrogenation, loses the last 10% of oxygen or sulphur. Crude oil with practically no oxygen is the result. This crude oil formed at relatively low temperature (below 200° C.) contains aliphatic, hydroaromatic and aromatic hydrocarbons—the same classes which one finds in natural crude oil.

These studies, therefore, have proved that, according to geochemical conditions, from carbohydrates oxygen-containing bituminous coals and oxygen-free gaseous, liquid, and solid hydrocarbons are formed. Artificial carbohydrate bituminous coals upon oxidation give exactly the same aromatic oxidation products, like benzoic acid, phthalic acid, diphenic acid, and benzene-, hexa- and pentacarbonic acids, as natural coals. These carbohydrate coals upon incoalification give exactly the same gaseous, liquid, and solid distillation products as one obtains by the dry distillation of natural bituminous coals.

Asphalts Become Crude Oil

These studies have proved furthermore that, contrary to the present belief, asphalts are not formed by the oxidation of crude oil. Asphalts are the parent material of crude oil. Upon intramolecular combustion (mild cracking) or by hydrogenation, they are transformed into crude oil. The hydrogen necessary for the hydrogenation is furnished by the conversion of aliphatic compounds into aromatic hydrocarbons, by condensation of smaller molecules to larger ones, by hydrogen sulfide resulting from calcium sulfide produced from gypsum or anhydrite, or by bivalent iron which is found very often in mother and reservoir rocks.

It has been found furthermore that adsorption phenomena during the formation and migration of oil play a very important role.

These new experiments have proved that most of the older theories have to be replaced by newer viewpoints stating that those very important gaseous, liquid and solid fuels are mostly formed from one class of parent materials—from carbohydrates which nature forms anew every year in the largest amount. Geophysical considerations show that hundreds of millions of years ago when plant materials containing little if any lignin were buried, the formation of carbohydrates was much greater than now.

This research work has brought new light on this very important question of the formation of fuels. It has shown furthermore that all kinds of plant material and waste which contain carbohydrates can be converted rather easily into different fuels. Therefore, leaves, grass, weeds, sugar cane, molasses, bagasse, seaweed, algae and similar carbohydrate-containing material can be transformed with rather simple industrial steps into either bituminous coals giving sandy, hard or porous coke, or into asphalts and crude oils showing the same properties as those important materials which nature put at the disposition of mankind.

National Defense Committee Surveys Gas Industry's War Facilities

TAKING prompt action to line up the gas industry's full resources behind the national defense program, the Association's Committee on National Defense headed by George F. Mitchell, president of The Peoples Gas Light and Coke Co., Chicago, has already completed a preliminary survey of the available gas industry facilities for the production of toluol—the essential ingredient to munitions manufacture.

As previously reported in the July–August issue of the MONTHLY, the four point program of the committee covers plans for uninterrupted service, measures for the protection of properties and lines, assistance in production of munitions, and cooperation from the industry's personnel. All these points are receiving the attention of the committee and a well-rounded defense program is now in the process of being perfected.

Toluol Production Studied

The survey of the present and potential supply of toluol was conducted by A. I. Phillips, consulting engineer and member of the Committee on National Defense, who donated his time to this project. Mr. Phillips canvassed manufactured gas companies and reported in detail on the following items:

(a) Estimated quantities of toluol now being recovered by the gas industry as light oil, tar still distillate, holder oil or drip oil.
(b) Estimated quantities of toluol that might be recovered by the larger gas companies by intensive scrubbing for light oil, together with that from the other sources mentioned above.
(c) Estimated cost of the additional facilities needed to secure the recovery mentioned in (b).

The toluol report was referred by the Advisory Council of National Defense to Major J. B. Harris of the Ordnance Department of the United States Army with headquarters at Wilmington, Delaware. This step was taken following consultation in Washington, D. C., by President Walter C. Beckjord of the American Gas Association, Marcy L. Sperry, president of the Washington Gas Light Company, and Major Alexander Forward, managing director of the Association, with officials of the Advisory Commission to the Council of National Defense headed by E. R. Stettinius, Jr.

Mr. Sperry has been designated as the representative of the gas industry in Washington to maintain contact with officials concerned with national defense.

No immediate problem is recognized by the executives of the Advisory Council of National Defense in the matter of gas supply, either manufactured gas or natural gas, although the council and the gas industry are alert to possible developments. Priority orders affecting the gas industry have not been considered and it has been stated to be the fixed policy to have such matters settled by private industry.

It is expected that the gas industry will make full use of the opportunity to explore all phases of the national defense program during the annual convention this month.

Study War Chemicals from Natural Gas

ACCORDING to reports from Calgary, Alberta, S. G. Blaylock, president and managing director of the Consolidated Mining & Smelting Co. of Canada, has announced that his company will investigate, at the request of the dominion government, the feasibility of establishing plants for the production of war chemicals from Alberta natural gas. A preliminary survey is being conducted, and a chemical analysis is being made of the various gases to determine whether or not they contain undesirable impurities. The survey will also determine the amount of gas available for chemical manufacture.

The company has offered to manufacture chemicals for the government for war purposes, on a strictly non-profit basis.

Case Histories . . . *Gas Summer Air Conditioning on the Delta*

By G. ELMER MAY, *Utilization Engineer;* R. E. JUDD, *Industrial and G. & M. Sales Manager; and* J. MASON GUILLORY, *Commercial Sales Manager, New Orleans Public Service Inc., New Orleans, Louisiana*

As Described to HARRY W. SMITH, JR.

Director, Industrial Gas Publicity, American Gas Association, New York

Hotel, Library, Office Building and Warehousing Jobs Indicate Diversity of Techniques Suited to Southern Business and Weather.

THE long summer seasons south of the Mason-Dixon line, *plus* the excessive humidities and moisture conditions extant along the Gulf of Mexico and the Mississippi, *plus* the build-ups of latent and sensible heat loads due to lighting, power usage and human activity in those fast-growing centers of manufacturing and commercial enterprise which are the nerve-centers of the new Industrial South—all three—have combined to make air conditioning important business in New Orleans.

For many years now, the New Orleans Public Service Inc., gas, electric and transportation utility, has exerted every effort and probed every possibility in trying to provide the citizenry and business folk of New Orleans with the best, the cheapest, and the most reliable types of summer air conditioning *for those special assortments of weather conditions and air conditioning requirements characteristic of the territory.*

Typical Southern Applications

Because those conditions and requirements are to be found elsewhere in the South, in localities not so experienced in the application of summer air conditioning equipment but acutely conscious of the demand for better weather control—and because there are in New Orleans a number of outstanding summer air conditioning jobs totally different in size, equipment and engineering details, but similar in that they have resulted in improvement and profit for their users—the following non-technical analyses of five successful gas-operated installations (both old and new) should be of joint interest to the air conditioning fraternity, the utility, and the prospective purchaser of air conditioning service.

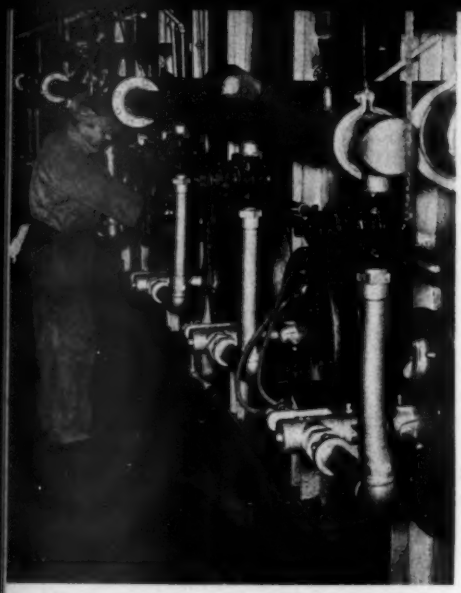
The applications to be considered are: (1) A veteran large steam-jet installation in a major hotel, (2) An ultra-modern turbine job serving one of the largest office buildings in the South, (3) A brand new multiple unit absorption type application adapted to a university library, and (4) The utilization of unit heaters for relative humidity control in sugar warehousing and steel storage.

In large and medium-size comfort applications New Orleans Public Service follows the policy of avoiding split systems and direct adsorption dehumidification units—for several reasons: (1) that it can design for less expensive investment in equipment by wrapping both functions (cooling and dehumidification) up in one package, (2) that direct dehumidification in the territory would involve the adiabatic removal of so much latent heat that the already large sensible heat load on most systems would be embarrassingly increased, (3) that city water supplies are not sufficiently cool to be used in after-coolers or other apparatus for sensible heat removal without the installation of supplementary refrigeration or other expensive apparatus, and (4) that adequate (though perhaps not ideal) dehumidification can be achieved by enlightened design and control of refrigeration systems primarily intended for cooling. Though not absolute, this policy has been supported by all estimates and service records to date in the New Orleans area.

Steam Jet Job Most Practical for Roosevelt Hotel

The six-year old steam-jet air conditioning installation at the 728-room Roosevelt Hotel, is designed to capitalize upon all the advantages just listed. Three damper-controlled Heine Boilers (two of 500 horsepower rating, and one of 300 horsepower rating) fired with high pressure natural gas (5 lbs.) by eight Forney Burners, were already installed and producing closely controlled 125-pound steam for myriad uses in the huge hotel before the steam-jet air conditioning job was purchased. Steam was being applied for winter room heating, water heating, cooking, dish warming, laundering, pressing, and numerous odd jobs even to the thermal cutting of bulk ice into individual cubes. With all this steam available the economics of the selection of steam-jet equipment should be obvious.

"In fact," says J. J. Bryner, chief engineer, "The addition of the air conditioning load allows us to operate closer to the capacity of our boilers all year 'round so that we obtain greater efficiency of the steam plant and more ease of operation. It takes 7200 pounds of steam per hour to run the two steam-jet units at rated capacity; and during our air conditioning season of May 15 to October 15, we often have them almost full-on from 6 A.M. to 2 A.M. To illustrate how the air conditioning has smoothed out our steam requirements, we use approximately 272,000 pounds of steam on an average summer day, and only 25%



The business-end of one of the three huge, damper-controlled boilers which supply 125-pound steam to air condition the Roosevelt Hotel in New Orleans. The engineer is adjusting one of the eight Forney gas burners

more, or 340,000 pounds on the coldest days in winter."

At the Roosevelt the condensate from the jets is returned to the feed water pumps of the boilers for make-up at 90° F., and the 1600 gallons of water per minute required by the jet units at full capacity for condensing the actuating steam is easily cooled from 99° F. to 86° F. by circulation through an atmospheric cooling tower on the roof.

Each of the two units is an Ingersoll Rand 100-ton, 4 nozzle, steam-jet unit, and any combination of jets may be operated at once with no loss in overall efficiency so that any load (in 25-ton steps) can be handled according to the requirements of the day. In addition to this 200 tons of air conditioning capacity, two 75-ton electric compression units (salvaged from the hotel's cold storage department when it was recently re-outfitted) add to the system so that peak air conditioning loads of 350 tons may be met.

Because of their flexibility and their economical operation on already available steam, the jet units are, of course, used for the main, or "base," air conditioning load. Mr. Bryner lists their special attributes as "greater flexibility, no moving parts, and low maintenance." He notes that, "In six years my only expense in connection with them has been the cleaning of shell-and-tube condensers before each season."

From both the cork-insulated "boilers" of the jet units and the water-cooling chamber of the compression equipment, water maintained at 46° F. is circulated through a baffled steel basement tank (30′ x 15′ x 7′ deep) whence it is distributed through a 7-gate manifold to the 11 coil houses at various points throughout the hotel to do its air cooling job. Tank and lines, of course, are heavily insulated.

Principally, the system serves the Hawaiian Blue Room, Lobby, Bar, Fountain Lounge, Coffee Shop, Grand Ball Room, University Room, Barber Shop, and 3 retail stores fronting on the street and renting from the hotel. The 11 fans total 63 horsepower, and the air thus delivered through the coil houses and into the conditioned spaces is reduced to 54° F. The humidity of the final room air is that which is the resultant of the near-saturated air delivered at 54° F. and the larger proportion of normal outside air with which it mixes in the various rooms.

Air Diffusion

To diffuse the air within the various rooms, the conditioned air is, generally, simply discharged from concentric "horn" diffusers, or anemostats, in the ceiling. In several quarters, such as the Coffee Shop and Bar, where cigarette and cigar smoke at peak hours can pile up rapidly, anemostats are double-ducted to help exhaust the fouled air. In the Hawaiian Blue Room, where fouling conditions can become particularly severe if suitable circulation provisions are not made, a double-duct system and exhaust fan is installed so that, if necessary, the entire circulating air may be exhausted to the outside and there is no recirculation in the room whatsoever.

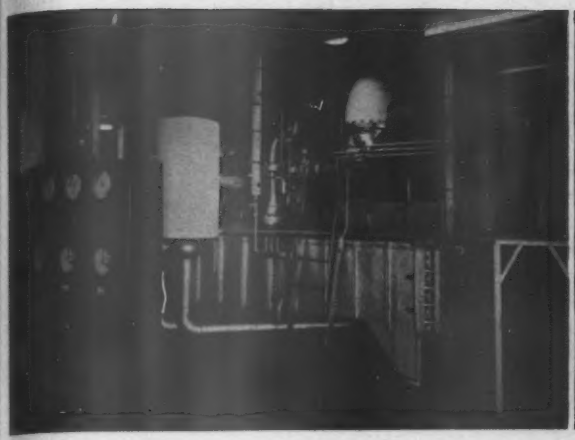
Some 150 to 165 of the Roosevelt's sleeping rooms are also air conditioned —with five 10-ton and one 50-ton Freon compressors handling individual blocks of from 18 to 78 rooms each— a system not associated in any way with the main 350-ton gas operated steam-jet and compressor system.

At the Roosevelt, the air conditioning system is practical, economical, and effective. It may not represent the ultimate in comfort summer conditioning, but it does do the most necessary part of the job in a simple, direct way adapted very nicely to the peculiarities of the hotel business. In short, to go further would invoke the law of diminishing returns.

Canal Bank Air Conditioning "Increases Rental Incomes"

The "last word" in large-scale comfort conditioning with gas is exemplified by the 1080 ton steam turbine installation serving every corner and crevice of New Orleans' thirteen year old, 80% rented, Canal Bank and Trust Building, one of the largest office buildings in the South with a rentable area of 330,572 square feet on 18 floors. Designed by Weil & Moses, consulting engineers, the installation has been in operation since June, 1938, includes additions to provide winter heating, filtering and humidification of both fresh and re-circulated air, and has "increased rental income substantially, as well as saved a great deal more money by holding tenants who have become acutely conscious of the growing availability of commercial air

Checking the temperature of the water flow from one of the cold-water "boilers" of the Roosevelt's steam jet system. The venturi constrictions of two of the eight 25-ton capacity nozzles are visible at the top of the photograph



Left—One of the Moore condensing, four-stage turbines (short dark cylinder at right) which drives its centrifugal compressor so efficiently that only 27.4 cubic feet of gas are used per ton-hour of refrigeration on the Canal bank job

Right—The two 400 h.p. gas-fired Heine cross-drum boilers which produce the 144-pound steam required for this job

The 18-story Canal Bank and Trust Building, largest office building on the Gulf—air conditioned from top to bottom with a 1080-ton steam turbine system operated from gas-fired boilers

conditioning in the South and its benefits."

One hundred and sixty pound steam is developed in two 400-horsepower Heine cross-drum boilers equipped with BL3 Forney high pressure natural gas burners and a Mason constant-steam-pressure regulator controlling back dampers, burner louvres and the butterfly gas valve. There are 50,108 square feet of steam radiation. It is interesting, though not pertinent, to note that air is circulated from a 2000 cu.ft. capacity blower through the hollow tile upon which the boilers are set so that the heat from the firebox will not crack the concrete waterproofing.

Operation Is Efficient

The developed steam is supplied to two Moore condensing turbines (1—950 h.p. 8 stage 4290 RPM and 1—400 h.p. 10 stage 4154 RPM) which are so efficient that in operating from 160 lbs. down to 26 in. of vacuum an extremely low water rate (in pounds of steam when condensed) of 13 to 13.5 lbs. per hp. hr. is achieved—and only 27.4 cubic feet of gas are used over-all (including all turbine auxiliaries) per ton-hour of refrigeration. Some 3800 gallons per minute of condensing water at 88° F. is used and heated to 108° F. before being conducted to the Marley forced-draft cooling tower on the roof. This tower is approximately 78' x 24' x 32' high and is equipped with four 10 ft. fans.

Both turbines drive centrifugal Carrier compressors, whence the refrigerant flows to cool 3300 gallons per minute of water to 46° F. before it is circulated to the 38 fan rooms on 19 floors. The fan load is 270 horsepower, although the total connected load on the system (including pumps, cooling tower, etc.) is 850 horsepower.

Some 112,000 c.f.m. of fresh outside air is handled by the ventilating system along with 255,000 c.f.m. of recirculated air—this proportion and volume being circulated both in the summer and the winter through the same ducts. The summer air conditioning setup is designed to produce conditions throughout the entire building of 78° F. dry bulb and 66½° F. wet bulb when outside conditions are as severe as 95° F. dry bulb and 79° F. wet bulb.

This turbine drive is superior in efficiency and operating economy to the steam-jet type of system unless waste heat utilization possibilities are great, as in the manifold operating departments of a large city hotel.

8 Refrigerating Units Involved in Year-'Round System for New Tulane Library

The new Howard-Tilton Library of Tulane University (200' x 122' x 3 floors) will also burn gas to develop steam *both* for winter heat and summer cooling and dehumidification. The boilers have not as yet been installed, but will operate at 240° F. to generate 12-pound steam for the purpose of fueling eight 35.2-ton Williams Air-O-Matic absorption refrigeration units.

These units will be arranged in two banks of four—one bank being manifolded to supply 106 tons of refrigeration to the 7-level "stack" section of the building wherein the University's 250,000 volumes, rare manuscripts and fine bindings will be housed—and the other bank being manifolded to deliver 126 tons of air conditioning to the remainder of the 3-story building where offices, reading rooms, and administration quarters are to be located. Either bank will be capable of handling 133 tons of refrigeration if need be; and both banks will be interlocked so that, if extreme emergency should ever arise, any part or all of the installation could be devoted to maintenance of required conditions in the stack section—where the very books and collectors' items that make a library (not

just the comfort of the occupants) are at stake.

For ideal preservation of manuscripts and bindings, constant year-'round conditions of 80° F. dry bulb and 67° F. wet bulb (45% R H) are called for. Chief sinner in the age-destruction of bound volumes is alternation of moisture conditions from excessively dry to moist and back again, which causes breakdown of the glues and other materials used in bookbinding.

Essentially the new Williams Air-O-Matic units each consists of five hermetically sealed shell-and-tube heat exchangers and a small activated alumina dryer. The refrigerant, methylene chloride, and the solvent, ether-of-tetraethylglycol, are both extremely stable and liquid at atmospheric temperatures and pressures. The operation of the interesting absorption cycle is based upon the high chemical affinity that the solvent has for the refrigerant, and the fact that the solvent boils at a temperature considerably above that of the refrigerant. Two hundred and twelve deg. F. steam is ample to distill refrigerant from mixture of solvent and refrigerant at atmospheric pressure. Since the refrigerant is actually allowed to evaporate at a pressure of 23" Hg, it can be seen that the entire system operates at a vacuum, and leakage and loss of refrigerant are minimized. A standard absorption refrigeration cycle is used, the only connected equipment being the boiler supplying the steam, and the cooling tower. It is interesting to note that the cooling tower on the Tulane Library job will be located in the rear yard, screened by landscaping.

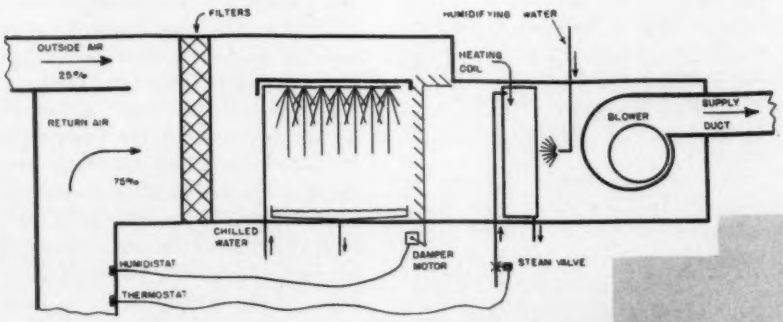
The water delivered by each bank of four units will be held at 46½° F. for distribution to a filter-washer-duct system such as diagrammed in the accompanying sketch. Noteworthy is the fact that the dampers regulating the ratio of cooled-and-dried to by-passed air are controlled by the *humidistat*, not the thermostat. This decision was made in view of the greater importance of latent rather than sensible heats in New Orleans summer weather, especially in buildings where high human occupancy is the rule. As a matter of fact, with an almost identical installation in the New Orleans Public Service office building it has been found necessary on occasion actually to reheat in the summer time by bleeding steam into the winter heating coil after the required dehumidification function of the cold water spray has resulted in too great a cooling. This action, of course, is automatic with a system such as diagrammed.

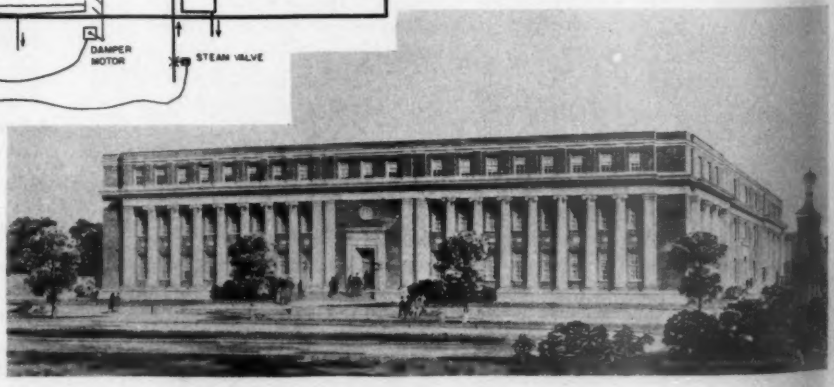
Another unusual and ingenious feature to be incorporated in the Tulane system on the basis of experience with the New Orleans Public Service building system, involves controlling the temperature of the chilling water, not by cutting units in or out as the *delivered* temperature of the chilling water exceeds certain limits, but by cutting units in or out (with step controls) as the *return* temperature of the chilling water passes into ranges indicative of the load on the system.

By the usual method the *delivered* chilling water can be maintained only within a 2 or 3 degree temperature range, which in turn makes it difficult to achieve really refined relative humidity control in the conditioned spaces. However, by cutting additional units in as the *return* chilling water rises in temperature to indicate additional load on the system, added capacity is supplied before the *delivered* chilling water temperature has had an opportunity to rise appreciably—and that *delivered* chilling water temperatures may be held within plus or minus ½° F. all the way from no load to full system capacity.

Virtues of Absorption Systems

Especial virtues of absorption refrigeration systems, such as the one being installed at Tulane, are space conservation, no moving parts, flexibility, and efficient operation. With manifold multiple-unit systems, the air conditioning plant may be operated *with no loss in efficiency* from zero to full capacity in steps corresponding to the capacity of a single unit. Thus, with an 8-unit job, operation at full efficiency and "as designed" is feasible at 12½, 25, 37½, 50, 62½, 75, 87½, and 100 per cent capacity. Such systems, of course, do not provide "waste" heat for extra utilizations as do steam-jet systems—and are not adapted to the huge requirement jobs.





Sketch of air conditioning and distribution system which will supply year-round air conditioning at the new Tulane-Howard Library shown at the right. The cold water supplied to the spray element will be produced in eight Williams Air-O-Matic units

M. Tognoni inspects 100 pound pockets of cane sugar stacked at the Bienville Warehouse Corporation to prove the value of unit heaters as moisture-regulating air conditioners

Here we have year 'round air conditioning in all its phases with *one* system and *one* fuel.

Unit Heaters Regulate Relative Humidity for Sugar and Steel Storage

Not all the air conditioning in New Orleans, however, is dedicated to comfort. Air control, particularly with respect to humidity, is vital in many industrial operations, notably storage and warehousing.

In two of the Bienville Warehouses Corporation's six warehouses along the Mississippi River docks, cane sugar, both domestic and Cuban, is stored in 100-pound bags or "pockets." Over 70,000 pockets may be warehoused on each of the two buildings' six sugar-storage floors (the top three in each structure). Rectangular piles of approximately 3,000 bags each are laid on temporary frames of spaced wooden strips resting on 2-by-4's which lie, in turn, edgewise on the flooring—so that ventilation under each pile is possible. A clearance of at least 2 to 2½ feet is left between the top of each pile and the 10-foot ceiling for the same purpose. Aisles separate the endless piles covering the 300 by 103 foot space of each floor.

Moisture is the devil which C. H. Pott, general warehouse superintendent, worries about. Though it has little effect upon the saleability of rice, coffee, or tobacco, it can raise havoc with sugar—by caking it, lumping it, or hardening the whole bag, so that the granulated crystalline structure is destroyed, handling in user's plant is awkward, and the consumer must grind or crush before use. Temperature is incidental so long as it does not exceed 105 or 110° F.

Accordingly, gas-fired unit heaters are installed, and so controlled by humidistats and temperature limiting controls that heat is automatically supplied on muggy days (winter and summer) as soon as the relative humidity tends to rise above the set figure of 55% relative. Thus, although no moisture is removed from the room, the moisture concentration (as a proportion of that which the air will hold) is reduced, and the sugar remains indefinitely in first-class condition. The thermostat simply prohibits the development of temperatures above 105 to 110° F.—and to date has not been called into action.

One of the six 75,000-B.t.u.-per-hour gas-fired unit heaters controlled by humidistats to limit relative humidities in the Bienville Warehouses to 55% or less, and also carry half of the circulation load

Circulation is provided both by the integral ½ h.p. fans and louvres of the six unit heaters plus the six additional No. 23-VL IIg fans completing the air conditioning system in each warehouse. On the second floor of each shed, each of the four corners is occupied by a No. 75B Continental gas-fired unit heater (75,000 B.t.u. per hr. input) aimed along one wall so as to establish circumferential circulation around the huge room. On the next (third) floor, the same arrangement is used except that (the heat input requirement being smaller by virtue of the heating on floor below it) two of the unit heaters are replaced by fans. And on the top floor, all heaters are dispensed with and replaced by fans so that circulation only is provided and all heat requirements are "borrowed" from the heated second and third floors.

Natural gas served at 6-inches water column pressure is reduced by a pressure regulator at each heater to a constant 4-inches; flues are of 4-inch galvanized pipe; heaters are hung 2 feet from the ceiling; and individual Minneapolis-Honeywell humidistats, thermostats and relays are provided for each unit heater.

In a similar installation at the New Orleans fabricating and warehouse plant of the Jones and Laughlin Steel Corporation where thousands of tons of metal are fabricated or warehoused annually, natural gas-fired unit heaters preclude the development both of red rust on the black iron and steel and white rust on the galvanized metal stored in a 90′ x 75′ x 23′ high room built for the purpose three years ago. Here, five Buffalo Forge 100,000 B.t.u. per hour gas-fired unit heaters do the job—automatically maintain 45% relative humidity. The room possesses hollow tile walls, an insulating wallboard ceiling, and includes a mezzanine about 15 feet deep on two sides. Sheet, plate, fencing, wire, corrugated sheet, gutters, ridgerows, bale-ties, wire rope, nuts, bolts, and other forms in black and galvanized iron are the principal materials stored.

Sweating of the metal is the danger, for much of it comes in packs, and moisture which can so easily be con-

To prevent the corrosion of stored iron and galvanized stock at the New Orleans fabricating and warehouse plant of the Jones and Laughlin Steel Corporation, five 100,000-B.t.u.-per-hour gas-fired unit heaters controlled by humidistats preclude relative humidities in excess of 45%

densed between packed sheets and linger there, will quickly give rise to wide blemished areas of either zinc or iron corrosion products. The plant is located along the New Orleans Industrial Canal connecting the Mississippi River and Lake Pontchartrain down which come the tug-towed company barges carrying the metal shapes and forms to be stored for subsequent fabrication or shipment to wholesalers. A large tonnage of metal, chilled from the barge trip, is moved into the heat-conditioned storage room per day. Were the atmosphere therein unduly moist, the amount of disastrous "sweating" on the stock would not be hard to conceive.

According to A. D. McCutcheon, plant superintendent, "Only because this conditioned storage room is available can we handle such a wide stock. Here we handle nearly all items our Pittsburgh mills produce."

Gas Toils to Make War Tools in Canadian Factories

(From *Saturday Night*, Toronto, Ontario)

THERE has never been such industrial production in Canada as we are now experiencing. Gas has never seen such service. Shipbuilding, the making of munitions, small arms, and aircraft, are all expanding tremendously.

Gas flames by the hundred thousand are spurting to meet demands.

In forging and heat treating departments for the relief welding of large welded units, turbine casings, and parts which come in contact with high temperature steam; in the tool shops where it is used for hardening and tempering; and in pipe shops where numerous annealing, forging, brazing, and bending and welding operations take place, gas heat is universally applied to our war effort.

Tool shops in our shipbuilding industry use gas for hardening and tempering the many hundreds of tools which are used in putting together a hull, fitting it, and installing the liver and lights to make it a ship.

Pipe shops are the places which construct the tubes and conduits on which our civilization rots, roosts, or r'ars up—according to your politics. Relief annealing furnaces, tinning furnaces, open hearth brazing forges, rosin kettles for melting the rosin used in copper tube bending and several portable gas torches likewise used in tube bending are essential equipment.

Aircraft parts are a vastly different, vastly more complicated affair. Whether or not the rupture of a piece of aluminum equipment in an airplane took place within or beyond the factor of safety built into it is simply a matter of checking back to its origin as a chunk of pig metal. Aluminum is very "open" in the hot state. If it is melted too fast, it is agitated to the point where oxidation sets in, which is rated as "dirt." Aluminum melts at 1217° F. and must be poured promptly when it reaches 1250° F. which is why gas is used—accurate control. Higher temperatures are bad for aluminum. At 1425° the added alloy is destroyed by cannibal molecular action within the aluminum itself.

Oven furnaces for heavy annealing and hardening have low temperatures—between 1,400 and 1,500° F. High speed hardening furnaces reach 2,400° F. Cyanide bath, used in case hardening, operates around 1,600° F.

The gas applications in production of a rifle or revolver are innumerable. There are 1400 to 1750 operations in making a Colt revolver, more in making a Bren gun. Gas is used in forging, heat treating, normalizing and hardening, finishing and bluing. Machined parts of guns conform to tolerances of 5/10,000 of an inch, and as many as 26 different gauges are used at one inspection bench.

Gas is used for coloring, preparing furnace atmospheres for blazing, for air drawing and annealing. Barrels are heat treated, small parts forged, coloring salts melted, soldering and high speed tool hardening accomplished with it. Chemical treatment of bores of rifle barrels to inhibit rust and corrosion is now carried out by gas.

The steely blue finish on revolvers is due to a gas process. In the Colt bluing room at Hartford, 30 large furnaces and eight small parts furnaces are used. The important thing is to guard the surface of the steel against moisture. Frames, cylinders, barrels, slides, receivers, and other parts come to the bluing room direct from polishing. Everything is first given a bath in hot gasoline to remove dirt, dust and grease. Bluing racks are built to hold parts about which air will circulate. A secret mixture of charred bone and primer is used. Readings are taken every fifteen minutes during the five hours of the process. Four gas-fired burners supply the heat in each furnace. The primer gives off smoke which keeps free oxygen away from the parts being blued and all the coloring is done by gas heat.

From these factories come the .50 and .30 calibre machine guns used on tanks and the Browning machine guns with which aircraft are fitted.

Truly gas is the power, behind the man, behind the gun.

A. G. A. Directors Meet in New York

The Association's Executive Board photographed at a meeting in New York City, September 10. Seated around table, left to right are: Vice-President George F. Mitchell, George S. Hawley, P. S. Young, Vice-President T. J. Strickler, Alexander Forward, President Walter C. Beckjord, R. H. Hargrove, H. L. Dickerson, Marcy L. Sperry, L. B. Eichengreen, Herman Russell, N. Henry Gellert, Frank H. Adams, Treasurer Ernest R. Acker. Standing—Henry Obermeyer, K. R. Boyes, D. W. Harris, F. B. Flabive, Bruno Rahn, John W. Batten, F. M. Goodwin, F. T. Carmody, F. H. Payne, N. T. Sellman, W. E. Derwent. Seated in back are: Elmer F. Schmidt, Louis Ruthenburg, Davis M. DeBard, F. T. Rainey

Gas Sales Are Up . . . *And We Planned It That Way!*

Clifford E. Paige

FROM 19,808,000,000 cubic feet of gas sold to 23,669,000,000 cubic feet, is the increase in volume made by this company, comparing the figures for the year 1935 with the year ended June 30, 1940. This is exclusive of gas sold at the World's Fair.

This increase was made by an extraordinary effort to prove that the future of the gas business must lie in developing and increasing sales volume. No one appliance and no single effort accounts for this result. It is, rather, a utilization of every sound idea in salesmanship available to us. Our effort extended into the field of making rates which would stimulate greater use of gas and thus, by providing increased volume, protect the rates offered the smaller customers.

Sales Allies Used

Further, as far as possible our people are trained to treat the use of gas as a service rendered by a company to its customers, rather than as a commodity to be merchandised. Using sales allies such as plumbers, dealers and other merchandising outlets, has been with us so long as to be no more a novelty. But by careful handling and fair treatment, our sales of appliances through these means have increased constantly year by year, and represent in no small measure part of the indicated increase in sales volume.

Success in selling must be attributed to good selling organization, and that refers to those directly engaged in New Business activity. Successful selling in this company goes further: it teaches all the people in the company, no matter how employed, that the first requisite of successful public utility service is that the members of the company believe in it; and that the development of its usefulness must redound to the advantage of all concerned—the customer, the stockholder, and then to the man himself who helps this undertaking.

- **Mr. Paige's article, which was prepared for "Public Utilities Fortnightly," provides evidence anew that attack is the best defense. When the depression started to make a dent in sales, instead of retrenching, the company embarked on an aggressive promotional campaign which utilized its full resources.**
- **That this sales policy has been intelligent and successful is readily apparent from the consistent gains registered in the last five years. It's a case history of which the gas industry may well be proud.**

By CLIFFORD E. PAIGE

President, The Brooklyn Union Gas Co., Brooklyn, N. Y.

This increase in sales did not follow a record of continually increasing sales over a long period of years. Quite the contrary. Like most business concerns, the gas industry and this company felt the depression and felt it keenly. There was, as is usual in depression cycles, a time lag and the gas industry did not feel the full brunt of depressive influences until sometime after that sad day in 1929, which ushered in a new era and a new conception of business relationships. Gas sales throughout the country suffered a decline, so much so that people were prompted to say that it was a decadent industry.

They were misled who, therefore, as a result of this reasoning, pulled down their flag and weakened their effort and their determination to render a necessary public service. There were those who felt that way, even to the extent of indicating that the securities of gas companies were no longer qualified for the best investment lists. It must be said for them, however, that having seen their error, they have striven mightily to overcome its handicap. This is especially noticeable in combination companies where selling energy was given over more to the electric side of the busines.

Probably Mr. Herman Russell's contribution had as much to do with the re-awakening of faith in gas prospect as any individual effort. The first problem in the rehabilitation of this industry was to check the downward trend of sales and to turn it back. It is a heartening thing to know that the experience of this company in this direction is practically that of all gas companies. This is not surprising since, thanks to the efforts of the American Gas Association, gas companies throughout the land are taking the best of each other's experiences and adapting them as far as conditions will permit, to their own operations.

Encouraging Gas Prospects

The outstanding encouragement in the gas prospect of today is not the absence of problems, but the clearness with which they are seen and appreciated, and the support of various efforts being made to unify and cooperatively to make the most of a real opportunity.

An example of the unity of opinion is indicated in the remarkable response to gas participation in the World's Fair. Thousands of gas appliances are operating daily in this area. Tremendous quantities of gas are used, and the public is made constantly aware—both by visual display of gas flames and by the products of gas service—that here indeed is something which the community must have.

To dramatize still further the gas possibilities and public interest, it is

necessary only to appreciate that about 20% of all the people who visit the World's Fair, visit the gas exhibit. But the point of unanimity and cooperativeness lies in the fact that the gas companies and the manufacturers of equipment allied with gas production and gas utilization, got together and made possible this showing, which is without doubt the most comprehensive advertisement the gas business has ever had.

Yes, we are enthusiastic.

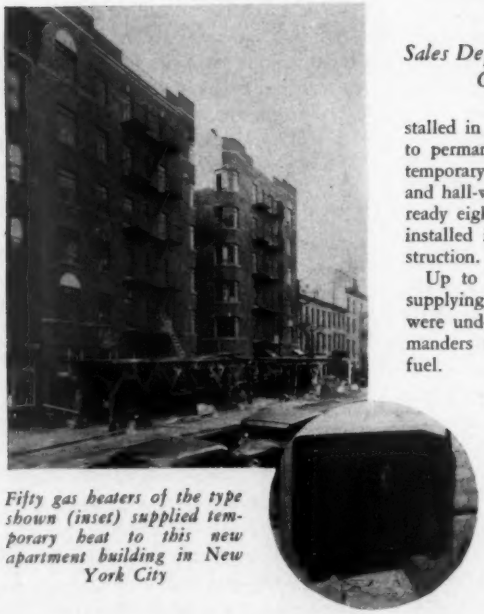
No More Welsbachs

THE Welsbach Company, Gloucester, N. J., manufacturers of Welsbach mantles for many years, suspended business on Sept. 1. Once used for gas lighting in millions of homes, the company at one time employed 2,000 men and shipped its mantles to all parts of the world. Although the electric light was demonstrated by Thomas A. Edison in 1879, five years before the invention of the Welsbach mantle, it was many years before the use of electricity became so widespread as to imperil the existence of the Welsbach Company.

Gas Provides Heat for New Building Construction

By W. F. POWERS

Sales Department, Consolidated Edison Company of New York



Fifty gas heaters of the type shown (inset) supplied temporary heat to this new apartment building in New York City

A NEW application of gas heating—the supplying of temporary heat for buildings during construction—has recently been developed by the Consolidated Edison Company of New York, through its wholesale business bureau. Gas has proved to be much cheaper than any other fuel for this type of heating.

A low-priced gas circulating heater of the unvented type is used. These heaters can be installed for temporary use at very little cost if the building gas piping is installed early in the progress of construction. In the case of apartment buildings, they may be connected to the outlets provided for the ranges and a temporary gas meter used during the construction period before individual meters for the apartments are installed in the basement. Where installation to permanent house piping is not feasible, temporary gas piping exposed in stair-wells and hall-ways has been found practical. Already eighty-five of these heaters have been installed in two buildings now under construction.

Up to now there were two methods of supplying heat to buildings where they were under construction. One was by salamanders using either charcoal or coke as fuel.

The other method was to connect and operate the permanent building heating plant early in the construction period.

The use of gas heaters eliminates the objections to these crude methods of supplying temporary heat. There are no odors and dangerous gases when using gas space heaters. Warm air is circulated throughout a large area. The plaster is not "smoked up" and no labor is required for their operation. They also take up an exceptionally small amount of space.

The company has made some estimates on the comparative operating cost of temporary heat for a 6-story, 71-family building during construction. The figures are given on a 30-day basis, a 24-hour day, and provide for all costs including labor. These estimates show the use of salamanders with crude fuel would amount to about $1,020 a month The use of the permanent heating plant in the building would run around $2,000 a month, while the use of gas space heaters would amount to about $750 a month. These costs are for winter weather conditions.

The Madison Square Boys' Club new building at 301-303 East 29th Street, New York City, is one of the buildings under construction now using the gas circulating heater of the unvented type. This building is being built by the A. L. Hartridge Company, L. H. Matthews, vice-president and chief engineer, and J. P. Cole, engineer in charge of the job. Thirty-five gas heaters have been installed with eminently satisfactory results. The cost of gas is approximately $500 a month.

Fifty gas heaters of this type have been installed by the 28th Street Building Corporation, at 206-214 East 28th Street. The results here are likewise very satisfactory, the gas cost being about $750 a month. J. B. Ratner, treasurer and manager of the 28th Street Building Corporation, states: "We have been able to proceed on scheduled time in spite of adverse job and weather conditions. The use of gas heaters during construction of our new 6-story elevator apartment house has brought about savings in time and money."

Temporary heat is required in buildings under construction for many reasons. In the first place, the lathers will not work in an unheated building. Also, during the plastering period it is necessary to prevent the plaster from freezing and it is likewise necessary to dry the plaster. During exceptionally cold weather heat is essential for the workers' comfort and also to prevent general freezing.

In addition to the decided economy of gas for temporary heat, other advantages are that it is clean, can be easily controlled, and requires no special labor.

New Synthetic Rubber Made from Gas

DISCOVERY of a new synthetic rubber made of oil refinery gas—a rubber that stretches better but bounces less than the natural—was announced in September to the American Chemical Society by the Standard Oil Company of New Jersey. It is called "butyl."

According to the report, the rubber is odorless and tasteless and is so pure that it looks like fresh snow. It is made on a new chemical principle and involves the work of a whole group of chemists for a period of ten years. The report was made by Dr. Perk Frolich, director of the chemical division of Esso Laboratories, Elizabeth, N. J., R. M. Thomas, I. E. Lightbown, W. J. Sparks, and E. V. Murphree.

In view of its military value, butyl is being studied by government authorities. It has many amazing properties, including increased strength as it gets hot, greater wearing resistance than rubber, and resistance to oxygen. Its tensile strength is weaker than rubber but gets better with age, until after a couple of years the synthetic product becomes stronger.

Man the Stoves! . . . *A New Approach to the CP Range Salesman's Job*

By Helen L. Kirtland

Home Service Director, Dominion-Republic Group of Companies, Buffalo, N. Y.

Helen L. Kirtland

FOR the average man, interest in cooking has been concentrated on the disappearing end. He has been too busy hustling for a living to take much interest in what goes on behind the closed kitchen door. It has been much simpler to bury his nose in the sporting page until the welcome announcement "Dinner is served."

Need for Cooking Knowledge

The gas range salesman was just as much in the dark about the real job of meal preparation as his next door neighbor, until alert sales managers realized that this lack of cooking knowledge was an obstacle which had to be overcome to make gas range selling easier. To be able to discuss the many conveniences, the time and food savings which modern gas equipment offers her would enable the salesman to meet his prospect on a basis which could not fail to interest her. He could answer the question in the mind of every prospect: How will this range help me to cook three meals a day quickly, economically and conveniently.

To answer this question, we developed a series of meetings to acquaint the salesmen with the various operations of modern gas cookery. In addition the features which women like best about modern gas ranges were discussed. Number one on the popularity poll—automatic oven lighting, the cleanliness of modern cooking equipment, and the like, were impressed upon them when they put the ranges to use.

The meetings took place once a week for an hour after the morning sales meeting. The Home Service representative explained what was to be done, why each method was used, and how it would have been prepared on outdated equipment. In addition she discussed the benefits claimed by men selling competitive fuels, contrasted them with those of modern gas equipment and stressed the superiority of gas as a fuel.

Canning being a timely subject, the first meeting showed them one of the important uses of the 250° temperature maintained in a CP oven. By way of contrast, one of the men canned some fruit by the old fashioned open kettle method. Another used the popular hot water bath method and the third processed the fruit in the oven while the Home Service representative explained each operation.

Individual Treatment

The men worked one by one, so that everyone was familiar with exactly what went on. They saw how the housewife might save herself time, trouble, heat in her kitchen and redecoration expense as well as producing a superior product by using the oven method made possible with the CP range. At the next day's meeting the results were exhibited and discussed.

The following week the men used the top burners. By actually preparing a one dish meal, cooking vegetables by the waterless method, making coffee and melting chocolate the flexibility and controlability of the burners was emphasized. The men quickly saw the advantages of no retained heat in top stove cooking when the coffee was prevented from boiling over by a flick of the burner valve to the simmer position. The melted chocolate proved a very effective demonstration of the slow low heat not only because it melted quickly over the direct flame without scorching, but also because we put it in waxed paper and even though the paper flared out over the edges of the cheap tin pan it was not burned. The concentration of the heat under the pan and the coolness of cooking on the top burners of the gas range were definitely proven.

Broiling Methods Taught

Broilers and broiling methods were our next topic of discussion. The men made toast and broiled a complete meal which they ate with gusto in spite of the early hour. The advantages of a separate broiler and the CP features which make broiling so convenient, quick and clean were stressed. A roast of beef was then started by the low temperature method and the men invited back at noon for hot roast beef sandwiches and coffee. Thus, they saw the juiciness, tenderness and small amount of shrinkage in the roast.

Cake baking, of course, was included in the series, since many women consider that the final test of a range is its baking results, in spite of the fact that they do most of their cooking on the top of the range. The men were divided into groups of three, one to do the measuring, one to do the mixing and the third to add the ingredients. Four layers of a standard butter cake were baked in the oven at once. While they were baking typical complaints were discussed, along with causes for failures and the advantages of the CP gas range oven for baking.

Since the CP range with its well insulated oven and its heat control is especially well adapted to the use of whole oven meals the men prepared one for the final meeting. While it was in the oven we divided them into two teams and put on a quiz program using questions covering the operations performed in all five of the meetings. We found the competition very keen

and the scores surprisingly close. The winners were presented with Eversharp pencils with which to sign up their prospects.

The results of these meetings have been interesting. We hope the men will build a more practical sales story, based on actual use which will be more convincing and have "woman appeal." We tried to offer them ammunition for giving the women a good excuse to buy. If the modern cookery story is really told by salesmen and Home Service women, it should have a big effect in keeping merchandise sold. Too often, after a sale, women meet friends who ask: "Oh, why didn't you buy another type of range?" The modern cookery story tied in with the CP story gives them the answer to this.

In a number of cases the men brought up selling arguments they were using at present and discussed them in the light of our recommendations for the use of the range. The result of this was that the Home Service and the Sales departments are now offering the same care and use story to the women. This will save a good deal of confusion to the customer on future gas range sales.

The men are also taking a keener interest in our cooking schools and prospect demonstrations and have requested us to include some of the recipes they had prepared at these salesmen meetings.

On the theory that if the salesmen could turn out satisfactory results so easily, the women could do it with their eyes shut, CP range sales should boom better than ever before and our competitors should find it still harder to make inroads into our cooking load.

A. G. A. E. M. Loses Al Cook

Al Cook

THE resignation of Albert F. Cook, advertising manager of the range division of the Association of Gas Appliance and Equipment Manufacturers, New York, was announced on August 20 and accepted with real regret by the gas industry. As assistant to R. S. Agee for the past year and a half, he has done an outstanding job of promoting the CP gas range. His resignation was due to ill health.

Prior to joining the A.G.A.E.M., Mr. Cook had served for ten years as assistant advertising manager of the Philgas Department of the Phillips Petroleum Co., marketers of liquefied petroleum gases. Before joining Philgas, he had gained extensive experience in newspaper, advertising agency and sales promotion activities.

Stanley B. Finch Gets Executive Post in Fair Organization

Stanley Finch

STANLEY B. FINCH, of The Brooklyn Union Gas Company, who has acted as coordinator of the gas industries participation in the New York World's Fair since its beginning, has been named secretary-treasurer of The Pavilionaires, Inc., a newly formed permanent organization stemming from the World's Fair Exhibitors Association. Organized on September 17, the new organization is designed to make the experience gained at the New York fair available to business and industrial managements of future fairs.

In emphasizing the constructive purposes of The Pavilionaires, Inc., Mr. Finch said:

"We hope to serve as a clearing house for information on financial, promotion and operating policies for any major fair that may be projected in the future. We shall be glad to work with both the promoters and prospective exhibitors of the next big fair."

Eligible for membership are major executives of exposition pavilions. Regular bulletins and an annual directory containing full information about the Pavilionaires and a list of members will be issued.

Col. Sherman A. Snapp, director of the Standard Brands building at the Fair, is first president of the Pavilionaires. Other officers in addition to Mr. Finch, are: R. R. Ryan, assistant director of the Ford Exposition, first vice-president; Earl W. Brown, director of the Florida State Exhibit, second vice-president. The board of governors includes the executive officers named above and L. G. Coleman, Railroads; Maxwell Harvey, New York Fair; Harold Wilson, Swift; Frank Armour, Heinz; C. D. Smith, Firestone; Gus Craig, Westinghouse, and W. L. Gibson, Petroleum.

Naming of Mr. Finch to an executive post in the new group serves to emphasize further his outstanding work in connection with the Fair's activities. Starting more than four years ago, when the Fair was only an idea, he has worked consistently to further the interests of the gas industry. He supervised installations of gas equipment at the Fair, maintained contact with exhibitors, and generally worked for the advancement of the industry. He played an important part in the planning and conduct of Gas Wonderland which has been one of the most popular exhibits at the Fair.

Largely as a result of Mr. Finch's efforts many widely known architects, designers and builders of the World of Tomorrow have increased regard for the advantages of modern gas service. With the wind-up of the Fair in sight, gas has consistently maintained its position as the favored fuel among exhibitors and management alike at the Fair. More than any other one man, Mr. Finch has been responsible for this achievement.

Housing Project To Use 662 Gas Refrigerators

THE El Paso Housing Authority has approved a resolution authorizing the installation of 662 gas refrigerators in the Alamito Housing Project. Gas refrigerators were selected because it was shown the gas refrigerators operated at a minimum of expense. The contract was awarded to the American Furniture Company, El Paso, Texas. Gas ranges are also being installed in the kitchens of the housing project.

Pyridine from Gas

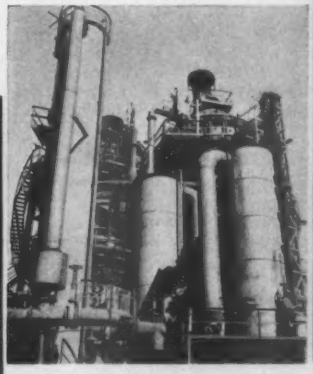
AMONG the most potent weapons furnished the medical profession in many years in its constant war on disease is the newly discovered sulfapyridine and its compounds and derivatives. It has been found especially efficacious in treatment of pneumonia, and has already literally saved hundreds of lives. An increased supply of pyridine, from which sulfapyridine is made, has been made available recently by perfected processes in recovering it from coke oven gas.

"Coke oven gas now appears to be the most important source of pyridine available," says the superintendent of the Republic Steel Company's by-product coke plant, where the process was perfected. In one month, recently, 40,000 pounds were recovered in two of the Republic plants. Originally pyridine was just a bothersome impurity that had to be eliminated.

Modern Gas Making
. . . *in Seattle's Plant*

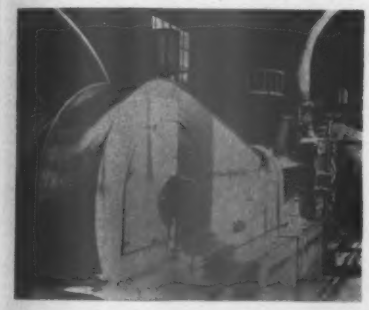
Taken by a photographer of the Seattle *Times*, these pictures were used in the rotogravure section of the Sunday *Times* on July 21, 1940.

Controls for water gas production are shown here, with J. J. Reynolds, plant superintendent, studying gauges. In this set, gas is produced by squirting steam on hot carbon (plant-produced briquets), with oil added later to bring up heat content



Oil and steam sprayed on hot fire brick (temperature, 1,800 degrees) in these two generators, make gas. Lamp black and most of tar in gas are removed by washing with water in this new unit at Seattle Gas Company's plant. Cooling by water causes precipitation of impurities

Recognized as a national authority on gas production is James F. Pollard, president and general manager of Seattle Gas Company. He is studying master chart control of plant operation. Two years ago he received the Charles A. Munroe and Addison B. Day Awards for greatest service to the gas industry



Feeding gas to 45,000 consumers is the duty of this big compressor. It compresses daily an average of 7,000,000 cubic feet of gas; in winter months the total often leaps to 10,000,000 cubic feet. From compressor, gas goes to holders

AMONG newest and most modern gas plants in the country is the Seattle Gas Company's fifteen-acre production development at the north end of Lake Union. More than $750,000 have gone into improvements by the company in the past year for latest equipment to produce gas and its by-products.

About 400 workers are employed to serve 45,000 consumers in the Seattle area, extending into rural communities as far as Kent. To them, gas is piped through about 1,050 miles of pipeline. With an annual payroll of $650,000, Seattle Gas Company operates day and night with three shifts of workers daily.

Liquid sulphur pours from this purification unit in gas production. A solution of arsenic, water and soda ash, takes sulphur from the gas. This by-product is barreled and shipped to a California chemical company

Erected by the U. S. government for production of toluol to make T.N.T. during the World War was the 85-foot tower on the left. Presented to the gas company, it now is a light oil absorption tower where gas is washed with oil. However, if needed by the government, it can be reconverted quickly for its original purpose. In the center is a two-million cubic-foot holder. At right, is a new fractionating plant, where oil used to wash gas is recondensed. From these towers and pipes come by-products: Benzol for anti-knock gasoline, toluol for T.N.T. and zylol for rubber industry

U. S. Fuel Facts . . . *More Gas Than Ever Supplied to Government*

SINCE the Washington office of the American Gas Association was opened eight years ago the sales of gas to the United States Government has increased from about two billion cubic feet to nearly twenty billion cubic feet per year. Three Government activities which have contributed largely to this increase are the Veterans' Administration, Bureau of Prisons, and the Bureau of Indian Affairs.

Veterans' Administration

All fuel matters pertaining to an original contract are handled by the Construction Service. There are three divisions in this service: namely, Technical, Legal, and Equipment. We must work with all three divisions in rate negotiations.

After an original contract for gas has been agreed upon the actual contract is handled in the office of the Director of Supply Service. Under this Director is the Division of Contract and Property which makes all fuel contracts, including renewals from year to year.

When an original gas contract is entered into, the specifications for the appliances and equipment that will be needed are written by an engineer in the office of the Director of Construction. It is with this particular office that we have worked in having high class appliances specified. Every specification now stipulates that all gas appliances and equipment must be approved by the American Gas Association Testing Laboratories.

All of the offices of the Veterans' Administration with whom we work are thorough in their investigation of all factors that enter into fuel costs and are completely unbiased in their decisions.

The Veterans' Administration is now using gas in 58 of their facilities. Thirty-two facilities use gas for the domestic load alone, and 26 use gas for both boiler and domestic use. The annual gas consumption is approximately 2,480,704,000 cubic feet.

- **As government agencies have grown apace, their requirements for modern gas appliances and increased gas service have increased enormously. This growth is traced in a series of articles by Mr. Bean who cooperates with gas companies desiring to do business with the Federal government.**
- **The first two articles in the series, covering the U. S. Housing Authority and the War and Navy Departments, appeared in the July–August and September issues. The current article deals with the Veterans' Administration, Bureau of Prisons and Bureau of Indian Affairs.**

By GEORGE W. BEAN

Fuel Consultant, American Gas Association, Albee Building, Washington, D. C.

Department of Justice, Bureau of Prisons

Very little gas was used by this Bureau up to a few years ago. We have had many conferences with officials in an effort to prove the superior value of gas as a fuel and now there are seven of these institutions using gas for both boiler and domestic purposes. There are two new institutions being built this year and gas has already been approved as the fuel to be used in them. The total annual consumption will be about 1,214,000,000 cubic feet.

Department of Interior, Bureau of Indian Affairs

The use of gas in this Bureau has been an interesting development. The appropriations made by Congress for fuel for the Indian Service are different from most appropriations. Two separate appropriations are made, one for the purchase of fuel at the mine or well and another for the transportation of same. When the Indian Service would advertise for fuel, the coal company would make a proposal to furnish coal for, let us say, one dollar a ton at the mine. The Indian Service would then determine the transportation cost to the Agency. This transportation charge would probably be $4 a ton, making the delivered price of the coal $5 a ton.

The gas company's proposal would naturally be for the fuel delivered to the Agency and the rate submitted might show a saving over the $5 delivered coal price, yet under the law it would have to be compared with the $1 per ton coal price. Therefore, gas was left out of the picture. It occured to us that there should be some way to change this situation so that gas could be considered.

An Obstacle Overcome

First an effort was made to have one appropriation made for the fuel delivered but this failed. Following that we had many conferences with officials of the Office of Indian Affairs, the Bureau of the Budget, and the Comptroller General's Office, and after more than a year's work they all agreed to our proposal that the gas companies be allowed to make two proposals, one for the price of gas at the well and another proposal for the transportation of same. This plan has worked very satisfactorily in the natural gas territory where the large majority of Indian Reservations are located.

In rate negotiations for the Bureau of Indian Affairs, we work with the Division of Construction and the Finance Office of the Indian Service and the Division of Purchasing in the Interior Department.

The gas consumption at Indian

Agencies has increased enormously during the past few years. There are now 40 Indian Agencies using gas, and the total annual gas consumption has now reached 1,945,147,800 cubic feet. In addition there will be new construction this year at 41 Indian Agencies which will mean a considerable market for more gas.

Newspaper Ad Wins Tacoma Prize

THE advertisement pictured here in greatly reduced form won first prize for the Washington Gas and Electric Company, Tacoma, in the Tacoma Advertising Club's annual contest for the "Best Single Advertisement by a General Advertiser." It appeared first in *The Tacoma Times* in a special edition celebrating the newspaper's occupancy of a new and strictly modern printing plant which uses gas exclusively in its operations.

Headed "In Step with the Times," its hard-hitting copy reads as follows:

"In our father's time . . . the horse and buggy or a bicycle. Today . . . the streamlined motor car!

"In our father's time . . . hand-set type and the old flatbed newspaper press run by hand. Today . . . gas-equipped type-setting machines; gas-equipped metal pots for the stereotype room . . . and the high-speed, multi-color rotary press such as *The Times* installation in its new plant.

"In our father's time . . . the cast iron gas stove, with fancy furbelows. Today . . . the beautiful, modern, streamlined, Certified Performance gas range; automatic gas water heaters; silent, machineless refrigerators; and compact, efficient heating units, to meet the demand of these modern times for speed, efficiency and economy."

You BE THE JUDGE

OF THE 1940 NATURAL GAS SECTION PROCEEDINGS

Evidence of an up-to-date, wide awake gas industry will be presented to all those who read the 1940 Natural Gas Section Proceedings. Probably no other publication gives such an inclusive and complete story of this phase of your industry. This year there are 338 carefully edited pages with adequately illustrated material to tell this story, and the names of those who have contributed papers and reports reads like a gas-industry "Board of Experts."

To cover a multitude of activities which goes on in a Natural Gas Section convention such as this year's annual meeting at Houston, Texas, May 6-9, the Proceedings have been broken down into the following headings:

1. General
2. Luncheon meetings
3. Transmission
4. Production
5. Industrial gas sales
6. Domestic gas sales
7. Accounting
8. Accident prevention
9. Employee education

Imagine, then, the number of important subjects which must be treated!

The Proceedings holds an honored place in every gas man's library. To mention a few of the vital subjects covered: The underground storage of natural gas, the contribution to the industry of research in the steel industry, the results of cathodic protection, an analysis of transmission costs, drilling beyond the first mile with rotary tools, some points on selling industrial gas, what women want in gas appliances, customer accounting and customer relations, and training courses available for natural gas employees.

Your copy can now be secured from Association Headquarters at the following prices: $2.00 to members, $4.00 to non-members.

AMERICAN GAS ASSOCIATION

420 Lexington Avenue

New York, N. Y.

Better Heating . . . *Sales Campaign Stresses Automatic Gas Service*

FIVE years ago, the United Gas Corporation serving Houston and contiguous territory in Texas, Louisiana and Mississippi began an intensive campaign to sell its customers the benefits of automatic gas heat. In that five-year period, its heating customers have gained apace; its gas sales have increased and its satisfied users have become staunch advocates of automatic gas heat.

Spurred on by this record, the company has just begun a new and greater campaign to enlarge this market. It's a full fledged effort, involving advertising on a large scale, sales training, cash prizes and dealer and manufacturer aids. It began on August 26 and will close in time for the salesmen to count their rewards before the Christmas holiday—on December 20 to be exact.

With 8,000 of the company's more than 160,000 customers now enjoying the matchless benefits of modern gas heating service, the campaign is based on a firm foundation of customer acceptance.

The current campaign will revolve around the Better Heat—Better Health slogan that has proved so effective in the past. It will emphasize the idea that Better Heating Brings Better Health, Better Living and Greater Profits for Business. It involves the home, the business and the factory—leaving no part of the market to the elements of chance.

An impressive array of heating sales aids has been prepared which include:

Visualizer for Salesmen

1. Better Heating Visualizer: "The Marvelous Story of Better Heating," revised for dealer use, is in two parts. The first section contains the complete Better Heating sales story. It's ideal in helping every member of the sales force master the customer benefits of Better Heating. The second section dramatizes the story—is designed for the salesmen to unfold before the prospect.

2. Display Card—"Remember Last Winter?" With this question and the drawing of a shivering man, the Better Heating display card for 1940-41 is a real stopper. It's ready for the windows and sales floors of all Better Heating Dealers.

Newspaper Ads

3. Newspaper Advertisements. A series of commanding Better Heating advertisements will appear in local newspapers during the campaign. At the bottom of each ad is the familiar invitation to "Buy From Your Dealer"

—a cue for each dealer to carry on from there.

4. Better Heating Survey. Attractive four-page survey forms, for commercial and residential installations, enable dealers to place a cash value on the advantages of Better Heating—help them break down sales resistance.

Installation Handbook

5. "Planning Better Heating Installations." This little 44-page handbook gives valuable information on measuring rooms, figuring heat losses, and surveying the complete B.t.u. input necessary. It will be placed in the hands of every dealer.

6. "The Window and Floor Salesman." This bulletin, designed primarily for Company offices, is also available for dealers who want to spruce up their displays. Included in the August issue are three attention-getting Better Heating displays which dealers may use to call attention to their own particular heating appliances.

More than $23,000 will be spent for advertising and promotion to put the story across. The first of the series of smashing newspaper advertisements appeared the week of August 26. More than 140 papers will carry a heavy schedule of these United Gas Corporation sales messages through September and October. Hammering away at customer benefits, sparkling ads tell about the comfort, convenience, cleanliness and healthfulness of automatic controlled heat. These ads will drive home again and again the theme of the campaign. Typical of the copy is the following:

"HE DIALED 72 AND GOT SPRING WEATHER:

"One turn of the wrist and your home will stay in the 'Comfort Zone' all winter! That's one of the many advantages of Automatically Controlled and Vented Heating—it helps to keep you comfortable and healthy regardless of sudden outside temperature changes.

"Better Heating is always ready to guard your loved ones against winters, chills and ills. Your Dependable United Gas Service sees to that! Thousands of wells in hundreds of fields and our twenty-four hour a day vigil over your gas needs insure constant Gas Service in your home."

Milder climate than their northern neighbors does not deter this company.

The well-planned sales story of the advantages of automatic gas heat jumps this selling hurdle as follows:

"We could use weather bureau statistics to prove that there is considerable winter in this climate. Instead of arguing, however, we can concede that point and still have a real need for Better Heating. The point is that Southern winters are so *variable* that we need Automatic Control more than people who live in colder climates!"

With this ground-work of aggressive advertising and sales promotion, the United Gas Corporation confidently expects to continue the upward trend in its gas heating sales. Since these campaigns were begun, the company has been consistently successful in adding new customers to its lines and even encouraging more and better dealer allies.

Better Heat-Better Health Schedules
August 26 - December 20, 1940

The force of constant advertising plus intelligent and aggressive sales promotion has brought about a ready public acceptance of gas heating in a climate where formerly hit-or-miss heating was the rule rather than the exception.

Above are reproduced the covers of two employee publications used to announce the Better Heating campaign. The sketch on the left is an idea for a window display suggested for dealer use

Gas Heating Equipment Sales Up 48.5%

A GRATIFYING increase in the sale of gas-fired furnaces (house heating equipment) throughout the country has been reported by C. W. Berghorn, managing director of the Association of Gas Appliance and Equipment Manufacturers.

Mr. Berghorn announced that during the first seven months of this year (January through July) sales of this type of house heating equipment were 48.5 per cent ahead of sales figures for the corresponding months in 1939.

It was also reported that during this seven-months' period domestic gas range sales were up 15.8 per cent and that sales of gas water heaters increased 13.3 per cent.

Francis Engel Dies, Dean of Gas Men

Francis Engel

FRANCIS ENGEL, vice-president and secretary of the Elizabethtown Consolidated Gas Company, Elizabeth, N. J., and one of the "grand old men" of the gas industry, died September 17 after one of the longest active utility careers on record. On April 13 of this year, he had completed his 68th year of active service with the company. He was 87 years of age and has been called the dean of gas men.

When Mr. Engel started his long career in 1872, the price of gas in Elizabeth was $4.00 per M on a flat rate. Today, it gets down to 40¢ per M on a wholesale rate. His service in the company spanned an active and progressive era.

He began his association with the gas company on April 13, 1872, a "Friday the thirteenth" which he always claimed was a good omen for him and not a bad one. A singular coincidence is that the last day Mr. Engel was at his office was on Friday, September 13, 1940.

One of a family of nine children, Mr. Engel was himself the father of nine. He was educated at St. Patrick's School, and at the age of 15 became a clerk in the office of the city receiver of taxes.

A few days before young Engel reached his twentieth birthday, he entered the company's employ as assistant superintendent of manufacture, at the plant at South Street and the Elizabeth River. The gas company, then known as the Elizabethtown Gas Light Company, had only been in existence sixteen years.

In 1893 he was elected a Democratic member of City Council from the old Ninth Ward, and served in council for twelve years, during the last years of his service, in 1903, serving as president of the city's governing body. In his last campaign Mr. Engel defeated former Mayor Victor Mravlag for the councilmanic position by a single vote, the only political defeat ever administered to the latter official.

John Kean, president of Elizabethtown Consolidated Gas Company states: "Mr. Engel was closely associated with the company from its small beginning to its present position. Its growth and expansion was largely the result of his foresight and progressive attitude. Civic minded and proud of his community he sought to give all the best possible gas service. He was always willing to give anyone the benefit of his knowledge and experience and he will be greatly missed by his many friends and acquaintances."

Accent on Simplicity in New Gas Model Kitchen

Modern gas kitchen constructed at Newport News, Va.

A MODERN, up to the minute, all-gas kitchen was installed for the use of the public at Newport News when the offices of the Eastern Division of the Virginia Public Service Company were moved to the company's own building.

The kitchen was designed by the home service director and the commercial manager of the company. The underlying objective was to build a kitchen of maximum efficiency at a cost well within the reach of the average family. Simplicity was the central theme.

Of the major gas appliances used, the refrigerator, the range and the water heater models were selected to blend in and harmonize with the cabinets. An electric dishwasher was built into the cabinets. Much attention was given to the lighting system of the kitchen. Hidden lights were used under the cabinets in order that glare might be reduced to a minimum.

Adjacent to the kitchen is a hall which was erected for the purpose of seating guests for demonstrations and cooking schools.

The model kitchen was dedicated for the general use of the public at ceremonies which were attended by more than 1000 housewives. Announcements that the kitchen was erected for the exclusive use of customers, were made through the press and direct mail. A formal opening was held from 9 A.M. to 9 P.M. Promptly at 9 o'clock at night, prizes were awarded by M. J. O'Connell, president of the company, to the successful registrants. A modern gas water heater and miscellaneous household appliances were the prizes given away.

Civic, religious, fraternal and other community organizations were informed that the kitchen and the hall would be available for their use for card parties, luncheons, or any other appropriate activities.

Company officials report that many organizations and quite a number of individuals evidenced an immediate interest in the offer by making reservations for the use of the kitchen and hall. It is anticipated that the company will achieve much good will from this idea.

AFFILIATED ASSOCIATION *Activities*

Pacific Coast Gas Association Holds Record-Breaking Convention

Robert A. Hornby, New P. C. G. A. President

THE forty-seventh annual convention of the Pacific Coast Gas Association held at Coronado, California, September 18-21 broke all existing Association records for attendance. The total registration was 792—the previous high being 656 in San Francisco in 1936.

Robert A. Hornby, vice-president of Pacific Lighting Corp., was elected president of the Association; W. G. Vincent, vice-president of Pacific Gas and Electric Company, was elected vice-president and D. G. Martin, general auditor of Pacific Gas and Electric Company, was elected treasurer.

New directors elected were R. G. Barnett, vice-president-general manager of Portland Gas and Coke Company, Portland, Oregon; W. C. Mainwaring, general sales manager of British Columbia Electric Railway Company, Ltd., Vancouver, B. C.; H. W. Edmund, sales manager of Coast Counties Gas and Electric Company, Santa Cruz, and W. R. Smith, vice-president of Continental Water Heater Company, Los Angeles.

The American Gas Association was represented at the convention by President Walter C. Beckjord and by J. W. West, Jr., secretary of the Commercial Section. Other general session speakers representing A. G. A. activities were Bernard T. Franck, chairman of the Refrigeration Committee, and R. S. Agee, sales promotion manager of the Association of Gas Appliance and Equipment Manufacturers.

In opening the convention, President Holloway announced that the Association would soon complete two projects which he believed of considerable importance to the industry—the first of these being a motion picture on gas cookery featuring Don Wilson and Hedda Hopper. The picture is in kodachrome with full synchronized sound, and according to Hollywood authorities the first such picture ever made. Mr. Holloway said that arrangements were being made to make prints of the picture available to all gas companies at a reasonable cost.

The other project was a sales training course for both gas company and dealer salesmen which would be available for distribution under the provisions of the George Dean Act. This course will be ready later this year and will be first put into effect in California. It is, however, available for use in other states which have supporting state legislation.

F. M. Banks, Addison B. Day Medal Winner

One feature of the convention which attracted a great deal of comment was an evening of entertainment provided by the Association's manufacturers section. This included a skit put on by the manufacturers entitled "The Court of Pedler's Opinion." Called before the court and tried for their offenses against the manufacturers were the leading sales executives of the Pacific Coast utilities.

The new president appointed C. P. de Jonge of the San Diego company, chairman of the technical section for the ensuing year; O. H. Doerr, Pacific Gas and Electric Company, San Francisco, chairman of the sales and advertising section; and S. W. Binckley, Southern California Gas Company, Los Angeles, chairman of the accounting section.

The manufacturers' section elected Wayne R. Smith, of Los Angeles, its new chairman, and C. O. Menig, of Los Angeles, vice-chairman.

The Association's Awards Committee granted a Committee Award to Mrs. Marguerite Scroggie, chairman of the Association's Home Service Committee. Mrs. Scroggie did a great deal during her year in office to further home service work on the Pacific Coast, and included in her convention program was a short presentation on a CP range entitled "A Lyrical Gasconade."

The Basford Trophy by a very narrow margin was voted to the Sales and Advertising Section—A. F. Rice, Occidental Stove Co., chairman.

The Board of Directors of the Association awarded the Addison B. Day Medal of Honor to F. M. Banks, vice-president of the Southern California Gas Company, for his leadership dating back to 1935 in the cause of improving performance standards of gas appliances.

CONVENTION CALENDAR

OCTOBER

Oct. 4-5 **Public Utilities Association of West Virginia**
White Sulphur Springs, W. Va.

7 **Association of Gas Appliance and Equipment Mfrs., Annual Meeting**
Hotel Claridge, Atlantic City, N. J.

7-10 **American Gas Association Annual Convention**
Atlantic City, N. J.

7-11 **National Safety Congress**
Stevens Hotel, Chicago, Ill.

16-18 **Independent Petroleum Association of America**
Dallas, Texas

20-24 **American Dietetic Association**
Hotel Pennsylvania, New York, N. Y.

21-25 **National Metals Congress and Exposition, including A.G.A. Combined Industrial Gas Exhibit**
Cleveland, Ohio

23 **New England Gas Association,** Operating Division
Hartford, Conn.

24-25 **American Management Association** (Office Management Conference)
Hotel Roosevelt, New York, N. Y.

NOVEMBER

11-13 **Mid-West Gas School and Conference**
Iowa State College, Ames, Iowa.

14-15 **Mid-Southeastern Gas Association**
Raleigh, North Carolina.

DECEMBER

2-4 **Joint Accounting Conference, American Gas Association and Edison Electric Institute**
Book-Cadillac Hotel, Detroit, Mich.

Empire State Gas & Electric Association

Irving K. Peck

SEVERAL hundred executives and department heads of various public utilities in New York State met September 26 and 27 at the Westchester Country Club, Rye, N. Y., for the thirty-fifth annual convention of the Empire State Gas Association. The convention, which was one of the most successful held in many years, was under the direction of Edward F. Barrett, president of the Long Island Lighting Co., who served as General Chairman. Edward P. Prezzano, president of Westchester Lighting Company and retiring president of the Association, was the presiding officer.

Irving K. Peck, president, Binghamton Gas Works, was elected president at a meeting of the Executive Committee on September 19. Other new officers are John L. Haley, president, Central New York Power Corp., vice-president; and Herbert C. Davidson, vice-president, Consolidated Edison Co. of New York, Inc., treasurer.

In the opening address, President Prezzano reviewed the activities of the Association's year and outlined the opportunities for service and mutual help offered by the Association.

A featured speaker at the meeting was George S. Hawley, president of the Bridgeport Gas Light Co. and vice-presidential nominee of the American Gas Association. Mr. Hawley discussed some of the vital problems facing the gas industry today.

Floyd L. Carlisle, chairman of the board, Consolidated Edison Co. of New York, Inc., made an important address on prospects for the utilities in the immediate future. Mr. Carlisle was followed on the program by Milo Maltbie, chairman of the New York Public Service Commission, who spoke on regulatory problems.

Other speakers included: H. E. Babcock, chairman, Board of Trustees, Cornell University; D. S. Youngholm, vice-president, Westinghouse Electric and Mfg. Company; Dannie Heineman, European utility operator, and Emmett F. Connely, president, Investment Bankers Association.

Research Fellows Named

APPOINTMENTS to cooperative fellowships at the University of Maryland have been given to Robert I. Jaffee, of Chicago, Ill.; Leonard Russell Hayes of Hamden, Conn.; Marriott W. Bredekamp of Washington, D. C.; James Grant Hayden, Jr., of Westernport, Md., and Francis Miles Bower of Mt. Rainier, Md., it is announced by Dr. R. R. Sayers, Director of the Bureau of Mines, U. S. Department of the Interior, and Dr. H. C. Byrd, President of the University of Maryland.

The fellowships are a part of the program of cooperation by the Bureau of Mines and the University of Maryland in bringing scientific research to the mineral industries of the United States, and particularly to the chemical industries of Maryland. The men will become candidates for the degree of Doctor of Philosophy at the University in the Department of Chemical Engineering.

Jaffee has been given the fellowship in connection with the Metallurgical Division of the Bureau of Mines. Bredekamp, while pursuing his graduate studies at the University of Maryland, will work in the Coal Division of the Bureau of Mines to study the action of combustion gases, particularly those containing sulfur, upon ceramic glazes. Hayes has been appointed to the fellowship in the Nonmetals Division of the Bureau of Mines at the University of Maryland.

Hayden has been appointed to a research fellowship in chemical engineering at the University of Maryland. Bower also has been appointed to a research fellowship in chemical engineering at the University of Maryland.

Manufacturers to Meet in Atlantic City

Frank C. Adams

THE Association of Gas Appliance and Equipment Manufacturers will hold its annual meeting on Monday, October 7, at the Hotel Claridge in Atlantic City, N. J., it was announced from the Association's national headquarters in New York. The meeting will be held simultaneously with the convention of the American Gas Association.

The principal event of the meeting of the Association of Gas Appliance and Equipment Manufacturers will be the election of officers and directors for the next fiscal year. Lyle C. Harvey, president of the Bryant Heater Co., Cleveland, Ohio, is chairman of the nominating committee.

Frank H. Adams, president of the Association and vice-president of the Surface Combustion Corp., Toledo, Ohio, will give the address of welcome at the main general session on Monday afternoon (October 7).

Guest speaker at this session will be Arthur Hirose, Director of Research for the McCall Corporation. His topic will be: "The Household Gas Appliance Business—An Appraisal and a Suggested Program."

As has been the policy of the Association, the annual meeting will be given over in most part to individual meetings of the Association's various product divisions. It is at these gatherings that the manufacturers review progress made during the past year and outline their forthcoming cooperative promotional activities in behalf of gas appliances.

Mid-West Gas School and Conference

THE twentieth annual Mid-West Gas School and Conference, conducted by the Mid-West Gas Association and Engineering Extension Service, Iowa State College, will be held November 11-13 at Iowa State College, Ames, Iowa.

An exceptionally fine program has been arranged and nationally known speakers will be present to deliver pertinent papers on production, distribution, metering and utilization.

Discoverer of Natural Gas in Canada Dies

DENIS ALEXANDRE COSTE, founder of the natural gas industry in Canada, died at Chatham, Ont., on August 18. He was 79 years of age.

In 1889 in conjunction with his brother, the late Eugene Coste, he successfully prospected for natural gas in Essex County, Ontario, and later in the same year drilled in the first commercial gasser in Welland County.

He was director and first vice-president of the Volcanic Oil & Gas Co., and was also for many years president of the Provincial Natural Gas, Light, Heat & Power Co., operating in the Niagara district.

Mr. Coste was a member of the American Gas Association.

A. G. A. Leader Attends Gas Short Course

Walter C. Beckjord, center, president of the American Gas Association, is shown attending the Appalachian Gas Measurement Short Course at West Virginia University which hereafter will be sponsored by the Association. R. W. Hitchman, of Charlestown, general chairman of the course, is on the left and at right is C. E. Lawall, president of the University

Organization Changes and Joint Conference Hold Accounting Section's Attention

By E. N. Keller

Chairman, Planning Committee, Accounting Section

E. N. Keller

THE desire of gas and electric utility accountants to combine their efforts in Association work has been discussed frequently, but in recent years because of increasing requirements on accountants' time for duties within their own companies (often because of requirements of regulatory bodies) there has been an insistent demand that much more could be accomplished and time saved by having combined accounting conferences. The two Associations have accounting organizations which practically parallel one another in their Committee set-ups and often representatives from combination companies find themselves duplicating work on the two respective Committees of the two Associations, thus it has seemed to many that something should be done to alleviate unnecessary work.

Joint A. G. A.–E. E. I. Meeting

The Edison Electric Institute several years ago established the practice of having an Accounting Conference in the late Fall. The American Gas Association two years ago resumed the practice of having a Spring Accounting Conference. The A. G. A. Accounting Section also has its activity at the Fall Convention.

Due to discussions which were initiated this Spring between the officers of the A. G. A. Accounting Section and similar officers of the Edison Electric Institute, an invitation has been issued by the latter to our Accounting Section to participate in a Fall Conference this year on an equal basis. This invitation has been accepted and plans are now under way for the formulation of a program which will be announced fully at a later date. At this time, it can be said, however, that the Conference will likely be held early in December in Detroit, Michigan.

A Program Committee of representative men from both Associations has been appointed and it is assured that the high standard set by former activities of both Associations will be maintained. This Committee, in addition to Section Chairman Keller of the American Gas Association and Bourne of the Edison Electric Institute, consists of:

American Gas Association

F. B. Flahive, S. J. Barrett, O. H. Ritenour, L. L. Dyer, H. C. Hasbrouck, H. E. Cliff, and O. W. Brewer

Edison Electric Institute

B. S. Rodey, Jr., L. A. Mayo, J. H. Lobban, Emil Ulbricht, H. B. Hardwick, A. S. Corson, and Merle Rainey

To better meet the requirements imposed by the coordination necessary to insure success of this Fall Conference and of any others which may come later, a slight change in the organization of the A. G. A. Accounting Section has been inaugurated in that all activities of a customer nature are under the direction of a "Co-ordinator." This means that the three basic activities of Customer Accounting, Customer Relations and Customer Collections, will be headed by a single individual having under his jurisdiction the Chairman of those respective Committees. The General Accounting activities are organized in the same fashion, i.e., Property Records, General Accounting, Depreciation Accounting, Taxation Accounting and Uniform Classification of Accounts while operating separately as Committees are to be under the control of a Co-ordinator.

The function of the Co-ordinator, as the name implies, is to prevent overlapping of studies in the Committees under his jurisdiction, to see that the Committees get organized and to keep the work moving to completion. In addition, he is the man representing his activities who will be charged with the responsibility of aiding in the planning of combined conferences.

Appointments have been made for Chairmanships of the various Committees as well as Co-ordinators, as follows:

Committee Chairmen

Advisory	F. B. Flahive, Columbia Gas & Electric Corp., New York, N. Y.
Editorial	W. G. Murfit, The Philadelphia Gas Works Company, Philadelphia, Pa.
Planning	L. L. Dyer, Lone Star Gas Company, Dallas, Texas

General Accounting Activities Group

Co-ordinator	S. J. Barrett, The Peoples Gas Light & Coke Company, Chicago, Ill.

Committee Chairmen

Depreciation Accounting	H. C. Hasbrouck, Utility Management Corp., New York, N. Y.
Property Records	E. F. Wressel, Northern Indiana Pub. Service Co., Hammond, Ind.
Taxation Accounting	R. M. Campbell, Standard Oil Company of N. J., New York, N. Y.
Uniform Class. of Accts.	S. J. Barrett, The Peoples Gas Light & Coke Co., Chicago, Ill.
Uniform Class. of Accts. (Natural Gas)	James Comerford, Gas Companies Inc., New York, N. Y.
Other General Acctg. Activities	O. H. Ritenour, Washington Gas Light Company, Washington, D. C.

Customer Activities Group

Co-ordinator	J. A. Williams, Niagara Hudson Power Corp., Syracuse, N. Y.

Committee Chairmen

Customer Accounting	D. E. Maloney, East Ohio Gas Company, Cleveland, Ohio
Customer Collections	Harold Quad, Public Service Electric & Gas Co., Newark, N. J.
Customer Relations	Harry Jeffs, Queens Borough Gas & Electric Co., Far Rockaway, N. Y.

Insurance Committee Reginald Fleming, Commonwealth & Southern Corp., New York, N. Y.

New Sales Training Method Introduced in the Gas Industry

AT the August 5 meeting of the A. G. A. Domestic Gas Range Committee held at the Palmer House, Chicago, Illinois, unanimous approval and acclaim were given to one of the most unique, yet effective plans yet devised for the education of retail range salesmen. The CP gas range manufacturers of the Association of Gas Appliance and Equipment Manufacturers immediately recognized the value of the idea and have dedicated the time of their CP gas range field promotional staff of A.G.A.E.M. to the execution of this new sales program. This new field staff has also been equipped with sound recording equipment and has been thoroughly prepared to give this service to gas companies as schedules permit.

This now famous idea, known as the CP Audio-Training Service, was first introduced to the industry in the Fall-Winter CP campaign titled, "The American Homemaker Speaks," which was recently mailed to more than 3,000 gas company executives. This article gives the background, developments and details of this new activity which is as modern and efficient as the CP gas range itself.

New Approach

Hundreds of volumes have been written on the subject of selling. Business colleges, universities, and many others have offered courses on selling. The majority of all books and courses on selling are based on the individual experiences of those responsible, in addition to their observation of the methods and practices followed by salesmen with whom they have been associated or in contact. It is so easy to observe the faults of others and to suggest remedies, yet there has continuously been a need for a more practical method of training, one that would be of specific interest to salesmen having a background of the fundamentals of selling.

Salesmen have long known that their weak point has been their inability to observe themselves and to judge their own weaknesses and strengths as they can judge the sales effectiveness of their associates. In recognition of this longfelt need, A. G. A. and A.G.A.E.M. now offer to the gas industry a personalized sales training service that enables each salesman to hear himself as others hear him.

CP Audio-Training Service has the advantage of being a method of training based on each individual's own experience rather than the experience of others. It is the first practical method of self-training for better sales presentations. The focal point of all sales effort is the presentation made to the customer. Supervisors and sales managers can explain to each salesman how his sales presentation might be strengthened, yet when the salesman can see and hear for himself from a presentation he has made how that presentation may be strengthened, then he is in a better position to improve his sales effectiveness than ever before.

At the A. G. A. Convention in Atlantic City, October 7-10, a CP Audio-Training booth will be featured in the Fountain Room in the main lobby of the Hotel Traymore. Tickets will be issued to the convention delegates in their registration envelopes which will entitle the holders to free auditions and voice recordings in addition to a thorough explanation of the new service described in this article. Actual recording machines will be in operation and gas companies may register to obtain this service for their sales force at this booth.

CP Audio-Training is accomplished through the use of voice recording equipment. Each salesman prepares a five-minute sales presentation that he believes incorporates the strongest selling points of CP modern gas cookery. In collaboration with an A.G.A.E.M. Sales Counselor this presentation is then recorded. The latest in portable recording equipment is used. As soon as this recording is completed, the presentation is played back to the salesman as one would play an ordinary phonograph record. The salesman hears his own voice with all of its many inflections. His own approach and sales story of the advantages and benefits of a CP range are presented to him as if he were the customer.

A salesman has the opportunity to decide whether, if he were in the customer's place, he would buy a CP range on the merits of the presentation made. Experience in other lines of industry has shown that Audio-Training is welcomed by the salesmen. They like it because they immediately recognize that it is a practical method of helping each one individually in satisfying the problems that he is faced with in improving his sales story. The interest aroused is so great that salesmen are not only willing, but anxious to spend the time necessary to prepare and write the presentation which they recorded.

Audio-Training Technique

CP Audio-Training appeals for other reasons; it offers each man the opportunity of developing a specific sales presentation particularly fitted to the individual's personality—one that meets the local conditions and one that considers each man's selling experience. The salesman has the opportunity of using his own initiative and of employing those sales principles he has found to be most successful. Then, too, everyone likes the idea of having his own voice recorded, of having a personal recording that he may review at a later date as a further means of self-improvement. CP Audio-Training is unique, it is new, and it is the first method of sales training to have a strong appeal to the person enrolled.

A. G. A. and A.G.A.E.M. offer CP Audio-Training to all residential sales personnel of all gas companies in the United States and Canada—field salesmen, floor sales personnel and home service representatives, as well as members of the supervisory staff eligible to enroll for CP gas Audio-Training. This service is being announced to all gas companies through the medium of the CP Fall program portfolio (The American Homemaker Speaks). Simple registration forms are included in this portfolio.

Every gas company registering its sales personnel for this service receives a com-

plete kit of CP literature and material for each member of the sales personnel who is enrolled. These materials are forwarded to the gas company well in advance of making the actual recordings, so that they can be used by the salesmen to good advantage in the preparation of the sales presentation. Additional materials are forwarded for use by sales managers and supervisors in assisting their organization to prepare themselves for the actual audition.

The Association of Gas Appliance and Equipment Manufacturers recommend that CP Audio-Training be conducted on a competitive basis. Each gas company is asked to explain to its sales organization that each person enrolling is going to be entered in a contest based on the preparation of the best sales presentations. After each person is enrolled, has completed his or her recording, A.G.A.E.M. advises that a meeting of all enrolled be held, at which time all recordings made are played. A vote is then to be taken by those attending the meeting to determine the winning sales presentations.

After judging has been completed, the experience gained can well make excellent subject matter for supervisor cooperation with the salesmen in assisting them to further increase their sales effectiveness. After all judging is completed, each one enrolled has his record given to him with the suggestion that it be kept and played from time to time for purposes of review and continuing self-improvement.

Initial contacts made by representatives of A.G.A.E.M. with leaders in the gas industry indicate that CP Audio-Training will be so well received that it will be advisable for interested gas companies to register early and to allow as much time as possible between the time of registration and the making of the actual recordings.

CP Audio-Training is new, it's novel, and like the CP range, offers advantages to the salesmen that are as modern as tomorrow.

Registration blanks were provided in "The American Homemaker Speaks" campaign and are being filled in and returned at a rapid pace. So enthusiastic were some companies over the possibilities of this enterprise, special machines were purchased for the permanent retention by the gas company for its use in follow-up training on ranges and home appliances.

According to L. C. Ginn, Chairman of the CP Sales Management Committee of the A.G.A.E.M., "Here's just one of the reasons why 'For Everyone in 'Forty-One It's CP.' "

Awarded Clipper Ship

Carrol A. Miller (left) regional sales manager for Servel, Inc., hands Clyde H. Potter, sales manager for Southern Counties Gas Company, one of the two clipper ship awards won by Southern Counties Gas Company in the American Gas Association refrigeration contest, while Norman R. McKee, vice-president in charge of sales, and A. F. Bridge, vice-president and general manager, look on approvingly

Valuable New "Mystery Awards" Spur Refrigeration Contest

OPENING a new year of intensive sales effort on gas refrigeration, the A. G. A. Refrigeration Committee has announced a series of valuable new "Mystery Awards" for high salesmen registered in the October sales contest beginning next month.

A carefully guarded secret—its nature known only to members of the Refrigeration Committee—these awards promise to be a grand surprise to the winners.

In addition to the "Mystery Awards," salesmen participating in this first monthly sales contest will compete for cash awards and have the chance to qualify for continued effort bonuses in succeeding months. Sales made during October count toward both the "Mystery Awards" and the new Annual Best Performance Awards to be announced later.

For Gas Companies, sales achievement on gas refrigeration during October will count toward the winning of quarterly "Certificates of Honor" and the annual awards for Best Performance over the 12 months from October 1, 1940 to September 30, 1941.

Divisions of competition for the year 1940-41 will be the same as this year. All companies and salesmen will register in the six major divisions. Classifications for companies will also be identical, with the single addition of a wholesale classification award in Division One.

Although registrations are classed according to companies, retail salesmen may be enrolled individually even though the company is not actively taking part in the contest as a unit. Registrations for the first quarterly campaign beginning October 1 may be made for the full three months or any single month as may be desired.

Careful timing of the October sales contest offers a real challenge to salesmen to show their bosses what can be done while the A. G. A. convention is in progress at Atlantic City. October is to be known as Loyalty Month, with each company dedicating its sales during that period to the company management.

Gas Refrigerators Shown

THE annual sales convention of Servel, Inc., will be held October 3-5, inclusive, at the Hotel Ambassador, Atlantic City, N. J., with executives, regional and district sales managers, and other selling representatives of the company in attendance, it was announced by George S. Jones, Jr., vice-president and general sales manager of the company. A complete line of 1941 Servel Electrolux refrigerators will be on display during the convention period.

To Hold Jobs After Army Service

SERVEL, Inc. has notified its employees that their jobs will be guaranteed for them after required service in the National Guard or Army under the present mobilization act.

The notice reads: "When Servel employees enter the government service through the proposed mobilization of the National Guard or as the result of any plan of selective service which may be adopted, they will retain their seniority status with Servel, Inc., and upon release from government service, such employees will be re-employed at their former or similar assignments as soon thereafter as conditions existing at that time may permit."

Cooking School in Honolulu

AT the request of the Honolulu Gas Company and the Honolulu Advertiser, the leading newspaper of the Hawaiian Islands, Gladys Price, Home Service Supervisor for the Southern California Gas Company conducted the 13th Annual Cooking School for those two firms, from July 22nd through the 25th. She was assisted by Valeria Coon, who succeeds Pauline Edwards as Home Service Director for the Honolulu Gas Company.

Hailed by the Honolulu Gas Company and the Honolulu Advertiser as the most successful cooking school ever presented in the Islands, attendance at the four sessions was estimated at more than five thousand.

Selling Points on Volume Water Heating

By W. H. LIGON

Atlanta Gas Light Co., Atlanta, Ga.

COMMERCIAL water heating is generally sold on rates that are high enough to be profitable to the gas company and low enough to be competitive with other fuels. We should, therefore, give it the attention it is due and reap the harvest that is still to be had in this field.

Gas for commercial water heating is a vital part of the load and resultant revenue of every gas company, whether natural, manufactured, or some other gas is sold. Because most of this water heating is sold with the use of storage tanks, we do not have the extreme peaks and valleys in our load curve that we do with most other gas equipment. The storage capacity of the tanks allows the installation of water heating equipment with lower hourly demand. And the hot water removed from these tanks is being replaced far into the night, or between the cooking loads when the demand on the distribution system is at its lowest. Furthermore, this is generally a year-'round load with very little variation between summer and winter use.

Market Survey Important

It is to our advantage to survey the field and find out what our market is and where our water heating prospects are. Last year's survey will not do. We are in a changing world, and the customer who was not a prospect a year ago may be in the market today. We will save ourselves much time and be able to make more sales if we have definite information showing those who have the greatest need for our hot water service. Surveys help us keep in closer contact with our customers and prevent our overlooking good prospects.

To show the classes of buildings that may be considered in the scope of Volume Water Heating, a large manufacturer classified 100 consecutive water heater sales as follows: 18 institutions such as charitable and semi-charitable homes, fraternities, fraternal buildings, memorials, etc.; 12 churches and church buildings; 9 garages, autowash stations and other buildings devoted to automobiles; 8 public buildings, fire and police stations, jails, city halls, state and government buildings; 8 schools; 8 factories; 6 office buildings; 4 drug and confectionery stores; 4 banks; 3 warehouses; 3 restaurants; 3 clubs; 2 hospitals; a hotel, beauty parlor, funeral home, bath house, printing plant, and a newspaper. These cover mostly large volume users and do not include those with smaller requirements, such as doctors' and dentists' offices, barber shops, grocery stores, meat markets, tea rooms, theaters, and many others.

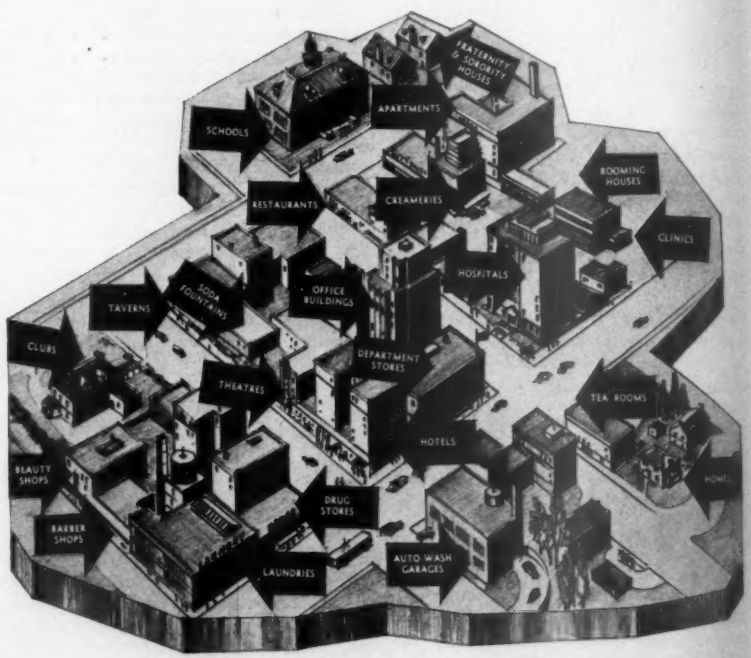
Perhaps we think too often of commercial water heating in terms of large volume water heating. This means the small jobs are being neglected. In cities large enough to operate a non-residential sales department, these salesmen are likely to concentrate on the large volume jobs because they are faster load builders, and the residential salesmen concentrate on domestic water heating because they can sell more water heaters in less time for this purpose.

In the smaller towns where one salesman sells everything, he is more inclined to sell domestic merchandise because he is more familiar with it, and because he is expected to get a large number of unit sales. When a large volume job does come up, he can usually get assistance from the manufacturer's representative if he needs it.

Several of us got together one day and in a short time named 123 industrial and commercial uses of gas in our city, only one of which was water heating. I dare say, if we took the time, we could name a thousand different uses of hot water, and perhaps it would pay us to do so. We could then take this list and see how many of our customers are in need of this essential gas service and find out who are using obsolete or inadequate water heating systems.

Discovering New Uses

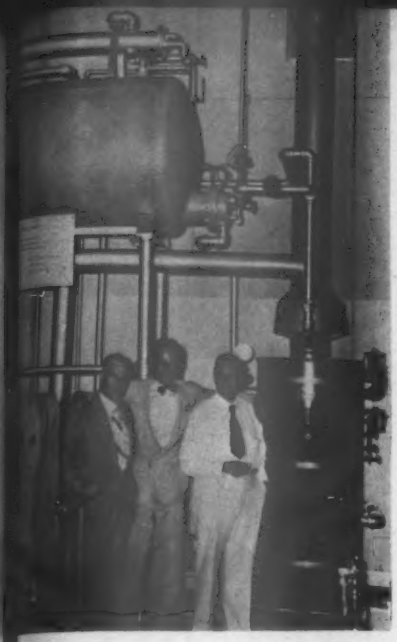
How many of us are thinking up new uses of hot water? I doubt if any of us could walk down Main Street in our own town with that thought in mind without discovering at least one new use of gas for water heating. It is my opinion that a greatly neglected field for gas water heating is the gasoline filling stations. Some of them have hot water, to be sure, but far too few. Think of the gas load awaiting us there. Thousands of filling stations, thousands of water heaters, and thousands upon thousands of cubic feet of gas. People want convenience these days. What was good enough for Granddad is not good enough for us. And convenience means plenty of instant hot water at all times.



Courtesy The Burkay Company

Your hot water prospect may be any one of those pictured above

Based on data presented at A. G. A. Hotel, Restaurant and Commercial Sales Conference.



Gas-fired water heating system at the New York World's Fair which supplies large quantities of water at 140° F. for general utility and simple dishwashing as well as smaller quantities at 180° F. for the sterilization function in dish and glass washing. In the picture are, left to right: A. V. Leudemann, R. V. Underhill, The Brooklyn Union Gas Co. and Ralph Leudemann

This is especially true in public places. It is our job to see that automatic hot water is there at the turn of the faucet.

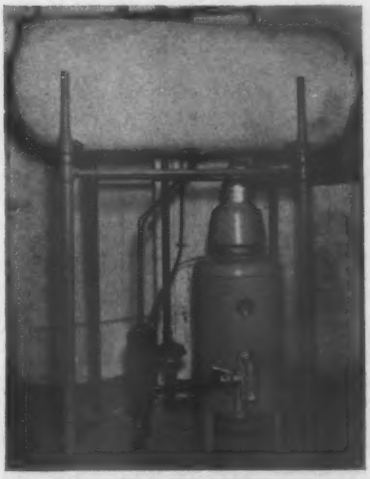
The refrigerator manufacturers are now stressing the replacement market for refrigerators. Are we missing a bet if we do not go after the replacement market in commercial water heating? Many businesses have grown in recent years but still have the same old water heating system, and run out of hot water just when they need it most. Restaurants serve more meals, small businesses build additions or add more space, hotels and apartments have more guests, the barber shops add another chair, beauty parlors add another booth,—and what happens? They run out of hot water and call the gas company. A service man goes out, but it is not a service man's job. It is the salesman's job. Here is a replacement market that will add a new load or protect the present load, and both are important.

Much is now being written and spoken about 180 degrees water for restaurants, hotels, soda fountains, and other eating and drinking establishments, and much 180 degree water is now being sold in every section of the country. It seems only a matter of time now until all states will have laws requiring water hot enough for sterilization in places where food and drink are served. This opens up a vast new and profitable field for hot water service and gas will have a distinct advantage because of its close temperature control and dependability. The demand for 180 degree water is bringing new and modern water heating equipment into the field. This means another selling help for us,—another means of breaking down sales resistance.

Recently we were in a restaurant and held a thermometer in the water supplying the dish washer. The reading was 90° F.! It was around two P.M., and the owner said that they were just finishing up the dishes; that the water was hot when they started. This means that about half of the dishes must have been washed in warm water and not hot water. It also means that our job is not done until we get plenty of hot water in this restaurant. People everywhere are becoming conscious of the danger to health from germs and diseases easily spread by using dishes and glasses that are not sterilized after washing. To have hot water when the dishes are started is not enough. It must be hot when they are finished. We like for our salesman to carry a small thermometer in his pocket in order that he may check the water temperature and be prepared to emphasize to the owner that he needs more hot water or to commend him on being a modern operator with modern hot water.

Water heating is becoming more and more a necessity in commercial establishments. Meat markets, food stores and eating places are awakening to the fact that the public caters to stores and restaurants that are clean. You and I like to eat in clean restaurants, and so does everyone else. Why don't we take advantage of this fact to help us sell hot water? We should encourage eating places and markets to advertise the use of hot water in washing utensils, meat blocks, dishes, and other things.

If we could make the public conscious of cleanliness in those restaurants that are clean and use sterilized equipment, we will have taken a long step in furthering our sales of gas for water heating, and we also will have done a great public service. Every gas company would do well to furnish stickers to go on the front door or window to call the customers' attention to the fact that he is going to eat out of clean dishes, with a clean knife, and a clean fork and a clean spoon.



Booster-recovery gas water heating installation in Liggett's Drug Store, Springfield, Mass.

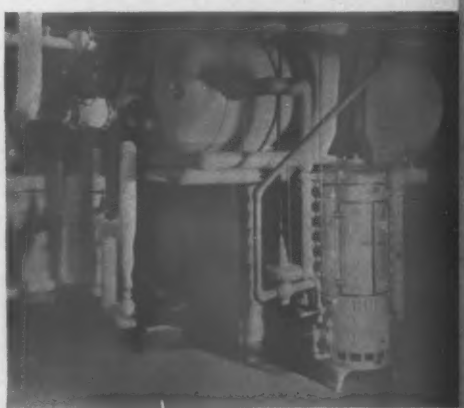
Large volume water heating sales do not just blow in over the transom. They are secured by hard driving, continuous work. It requires careful study of each prospective customer's individual water heating problem. These jobs must be engineered. We cannot afford to underestimate the hot water requirements. Our customers are entitled to equipment that will assure plenty of water of the proper temperature at all times. If water heaters are undersized, we not only have a dissatisfied water heating customer, but we will have lost his confidence when we attempt to add other gas equipment for his use. Nor can we afford to oversize the equipment, especially where competition is keen and a few dollars difference in the price of equipment may lose the business to our competitors whose equipment uses other fuel. Since volume water heating is a profitable and desirable load, it will more than justify the time to get the necessary information for properly sizing equipment.

Gas Equipment Improves

Cost of operation for gas water heating goes down year by year as efficiency of water heaters goes up. Each year we have something better to offer our customers and each year we have something better with which to combat competition.

Gas provides a completely automatic water heating service entirely free from labor and inconvenience. There is no fuel to be ordered and no storage is necessary. Certainly no other fuel is so quick, so clean and so economical as gas for heating water in commercial establishments whether the volume is large or small.

Automatic storage water heaters for smaller commercial establishments are a thing of beauty. They have been streamlined and dressed up to the point where they will fit in with any modern equipment. They no longer have to be installed in the basement or else be an eyesore. They can be installed in the barber shop or beauty parlor or drug store in full view and without shame. Think of the contrast with the



A multi-coil automatic gas water heater and storage system for general factory service. Capacity 500 gallons per hour, 60° rise

fast disappearing side arm heater with which everyone is familiar.

Cleanliness and a constant supply of hot water are essential to the business of beauty parlors and barber shops. Their customers are impatient and will not return if they have to wait for water to heat. It is of vital importance that we anticipate the possibilities of another chair or booth at some later date and if possible provide for this increased demand with the first installation.

One of the greatest aids in securing gas water heating installations lies in the help of the architects, engineers and contractors. We must continually bombard them with sales literature, engineering bulletins, and specifications on water heating and water heating equipment, and they must be kept informed of any new developments, methods of installations, rates, and operating costs. The more familiar they become with gas water heating equipment, the more likely they are to specify it when the opportunity arises. It is our job to see that they gain a greater knowledge of gas water heating and a greater appreciation of the use of gas for this purpose. Others who should receive complete facts and information are the plumbing and heating contractors, and the real estate companies who serve as operators and managers of apartment houses and office buildings.

We should take full advantage of the sales helps furnished by the manufacturers of water heating equipment. Most of the manufacturers furnish sales manuals with complete information on properly sizing equipment, all the many advantages of gas for water heating, lists of types of users who make the best prospects, and many hints on selling, together with various useful engineering data. These people also provide direct mail literature which we would do well to make use of. If this literature is sent out in advance of cold canvass calls, it will help pave the way for an interview. If personal calls are not to be made, direct mail literature sent regularly will fill in the gap to keep the prospect water heater minded in the absence of sales calls. Furthermore, representatives of manufactures are available from time to time and are willing and anxious to go out on sales calls to lend their help when it is needed.

The importance of commercial gas water heating is unquestioned, and we all agree that new markets are opening up each day; therefore, it is up to you and me to stay on our toes and go out and get that business which is rightfully ours. Getting this business is a matter of seeing a maximum number of potential customers, telling them the story of hot water service, and asking them to buy.

Gas Industry To Play Big Part in National Metal Show

IN this day of high-speed production in the interest of national defense, the metal industry in all its phases is more important to the gas industry than ever before. The metal industry has always been one of industrial gas' biggest customers—and today presents more possibilities than ever because of the frantic speed with which it is tooling-up to produce staggering quotas of tanks, engines, arms, battleships, and other metal implements of war. For this reason, the 1940 *A. G. A. Combined Industrial Gas Exhibit* at the National Metal Congress and Exposition, Public Auditorium, Cleveland, Ohio, October 21-25, offers us the biggest single opportunity yet—to sell gas and gas equipment for both ferrous and non-ferrous metal treating and melting.

As in previous years, the A. G. A. Industrial Gas Section will sponsor a combined exhibit covering 6,000 square feet of space, the largest exhibiting unit at the Metal Show; and 15 leading manufacturers of various classes of gas equipment for use in metal and metal products production will fit out and man with a total of at least 70 sales representatives individual displays within the combined area.

Gas companies within a radius of 200 miles of Cleveland have also contributed to make effective unified decoration possible, and to supply industrial gas sales representatives to help staff and service the huge combined exhibit at all times. In addition, of course, representatives of the A. G. A. Industrial Gas Section will be on hand to supervise and coordinate the entire exhibit.

The gas man's slogan at the show this year will be "INDUSTRY needs SPEED—SPEED means GAS"; and all presentations will emphasize the equipment and facilities available from the gas industry for fast, efficient, flexible, up-to-date metal treating and melting. The back wall of the central lounge provided for the general gas industry story will feature a huge chart (80 square feet in size) showing the actual year-by-year growth of both industrial gas consumption and general business activity since 1929. It will be obvious at a glance that, using the year 1929 as a base, the use of gas by American industry has grown very much more rapidly than general business activity itself—that the use of gas by industry for the first six months of 1940 was 50.4% above 1929, whereas general business activity (Standard Statistics Index) was only 5.8% above 1929.

Equipment to be covered by the manufacturers' displays will range in size all the way from tiny burner tips to tremendous contract ovens and models of furnaces several hundred feet in length—and in character all the way from large water heaters, boilers, and controls to recirculating air heaters, atmosphere furnaces and radiant tubes. Within the confines of the A. G. A. Combined Industrial Gas Exhibit will be shown equipment for doing practically every conceivable type of heating job encountered in any branch of the metal industry's operations.

The list of exhibiting manufacturers will include: American Gas Furnace Co., Burdett Manufacturing Co., Continental Industrial Engineers, Inc., The C. M. Kemp Manufacturing Co., Despatch Oven Co., Eclipse Fuel Engineering Co., Fieser and Lundt, Inc., The Gas Machinery Co., Charles A. Hones, Inc., National Machine Works, The North American Manufacturing Co., The Partlow Corp., The Selas Co., Sellers Engineering Co., and Surface Combustion Corp.

To accomplish the dual job of (1) marshalling all the gas industry forces at the National Metal Show for cooperative effort during the week and (2) paying homage to the metal industry press for its fine cooperation in industrial gas publicity and advertising activities, the annual Industrial Gas Breakfast of the National Metal Congress will be held by the Industrial Gas Section at 8:30 A.M. in the Lattice Room of the Hotel Statler, on Tuesday, October 22. H. Carl Wolf, Chairman of the Industrial Gas Section, will preside, and remarks will be offered by C. E. Gallagher, President, The East Ohio Gas Co., Cleveland; Prof. Bradley Stoughton, Lehigh University, Bethlehem, Pa., and Vice-President-Elect, American Society for Metals; and W. E. Steinwedell, President, The Gas Machinery Co., Cleveland.

Wind-up feature of the Breakfast program will be a special surprise event addressed to the editorial staffs of all trade, technical and business publications appealing to metal industry readers. It is urged that all industrial gas men (representing utilities or manufacturers) who will be in or near Cleveland on October 22 make it a point to attend this function in the interest of organizing their activities in connection with the Metal Show for maximum results.

The gas industry's participation in this leading event of the metal industry calendar is under the direct supervision of a committee lead by Karl Emmerling, Industrial Fuel Engineer, The East Ohio Gas Co.

Gas Sales Reinforcement

FROM Toledo to New York this month went E. A. Windham to take over the Eastern representation of Surface Combustion's Kathabar Summer Air Conditioning Division—his GHQ to be at Surface's sales offices, 420 Lexington Avenue, behind the same brickwork as A. G. A. Headquarters. Filling in behind Roy Scott (off to Sprague Meter in Bridgeport), Windham will battle for lithium-chloride dehumidification air conditioning jobs, chiefly in the large or medium size industrial and commercial classifications.

RING OUT THE OLD Association year with a "Hats off!" to the 163 industrial and commercal gas men who served during 1940 on the Industrial Gas Section's 20 committees—and were responsible for a record year of progress in the service of non-residential gas loads. If you ask them, you'll find that they all feel, "We received as much or more than we gave."

♦

MAYBE YOU heard it on the radio—when Ass't Sec'y of War, Judge Robert P. Patterson, said, "Tooling-up is today's chief problem in National Defense." Metal treating and melting furnaces are, we've been taught, industrial tools.

♦

IF YOU'RE a good salesman you'll convince your customers that the time to consider heat treatment is *before the part design is off the drawing board.* Many a new-part investment has been wasted (or at least needlessly enlarged) by tooling-up for the production of the part before its method of heat treatment (and its reaction to heat treatment) has been thought through to the bitter end. "Prima donna" alloys should be specified only if the extra cost of their special heat treatment is justified—designs should be avoided that might rupture, buckle, distort or complicate subsequent machining as a result of normal heat treatments.

EVER HEAR of a trade-journal-readership survey? BAKERS HELPER had the leading independent bureau for such studies ask hundreds of bakers about each and every editorial item in three of its issues—and the feature which rated highest for recognition, readership, and value-to-reader was a picture story of an all-gas bakery *supplied by your A. G. A. Industrial Publicity department.* That vote for our Section activities, gentlemen, came from the *customer* direct.

♦

PRIZE of the month in the Product-Improvement-Parade: Blodgett's new streamlined gas oven, which offers the baker bottom-heat adjustment by the insertion of an insulated retarder on each deck floor. So many are its new features, that you'd better write and get a catalog yourself.

♦

COMES THE NATIONAL METAL EXPOSITION this month (see story on preceding page) where 15 manufacturers of gas-using equipment will have a chance to strut their stuff in the A. G. A. Combined Industrial Gas Exhibit before 32,000 metal people—33% engineers, 11% metallurgists, 10% presidents, 10% superintendents, 8% vice-presidents, treasurers and secretaries, 5% managers, 5% chemists, and 5% purchasing agents. We assume you're making it a point to cash in on this conclave of "blue book" prospects—and use the facilities your Industrial Gas Section is providing for you.

♦

WE ARE ADVISED: "Chain fountains and restaurants buy more than 125 million dollars worth of food products annually." We ask: "How is it all cooked?".

♦

LOOK UP and clip for your sales portfolio: "Practical Gas Carburizing," J. F. Wyzalek and M. H. Folkner, METAL PROGRESS, September, pp. 261-8; "Some Things You Should Know About Burning Natural Gas," George L. Ballard, BRICK & CAY RECORD, July, pp. 22-4; "Edgar P. Lewis & Sons—Use of Ten Silica-gel Dehumidifiers," Dana R. McNally, HEATING & VENTILATING, August, pp. 37-40; "Modifying Presses for Coldset Printing with Gas-fired Boilers," Harry W. Smith, Jr., PRINTING EQUIPMENT ENGINEER, September, pp. 22-4.

INDUSTRIAL AND COMMERCIAL NATIONAL ADVERTISING FOR OCTOBER

The National Advertising Committee of the Industrial Gas Section, J. P. Leinroth, chairman, and F. B. Jones, vice-chairman, announces that full-page advertisements will appear in the trade and business magazines listed below during the month of October. These advertisements are prepared in cooperation with the Committee on National Advertising as a part of the Association's national advertising campaign.

Hotel and Restaurant Field

AMERICAN RESTAURANT	"Foods perfectly done with dependable Gas equipment." . . . . Clark's Shakertown Restaurant, Cleveland, Ohio.
HOTEL MANAGEMENT	"Gas is clean, accurately controllable, flexible, and fast. We wouldn't use any other fuel." . . . . St. Clair Country Club, Bridgeville, Pa.
CHAIN STORE AGE (Fountain & Restaurant Section)	"We use Gas extensively in our fountain grills, and strongly recommend its use." . . . . Sontag Drugstores, Hollywood, California.

Processing Industry

CHEMICAL & METALLURGICAL ENGINEERING	"Industry calls for speed . . . . *more speed,"* plus tie-in advertisement on gas applications in processing field.

Metals Industry

THE IRON AGE (Oct. 10*) STEEL (Oct. 14*) METALS & ALLOYS METAL PROGRESS INDUSTRIAL HEATING (* National Metal Show Issues)	Business Week advertisement entitled: "Industry Calls for Speed . . . . *more speed,"* plus tie-in advertisement on Gas applications in metals field.

Ceramic Industry

CERAMIC INDUSTRY	Business Week advertisement entitled: "Industry calls for speed . . . . *more speed,"* plus tie-in advertisement on gas installations in Ceramic field.

Food Industry

BAKERS HELPER (Oct. 12)	"Economy in operation; improved product, and saving in floor space and fuel with new Gas-fired oven." . . . . Baker Paulsen, Chicago, Illinois.
FOOD INDUSTRIES	"Gas-fired ovens help meet strict United States sanitary tests in meat processing." . . . . Kuhner Packing Co., Muncie, Indiana.

General Manufacturing

BUSINESS WEEK (Oct. 19)	"Industry calls for speed . . . . *more speed."*

Ammonia as an Aid to Purification

By L. T. Calhoun

Chief Chemist, Montreal Coke & Manufacturing Co., Montreal, Quebec

Historical Background

During the summer of 1931, when recovery of ammonia was no longer profitable, we conducted plant scale experiments at Montreal to investigate use of ammonia as an aid to gas purification. It is beyond the scope of this report to give detailed information on methods tried and results obtained. Anyone desiring full details should refer to the paper "Liquid Purification with Otherwise Waste Ammonia" presented before the September, 1933, Convention of the Canadian Gas Association by the late John D. Price, manager of Montreal Coke & Manufacturing Company.

Following preliminary experiments we operated for more than two years, with the saturators by-passed, utilizing the final cooler as a condenser for ammonia vapors and absorber for hydrogen sulfide. Resultant liquor was pumped over the producer coolers where part of the ammonia and an appreciable portion of the hydrogen sulfide were taken up by the producer gas and burned in the coke oven heating flues. Operation was limited to methods which neither polluted the atmosphere with objectionable odors nor the sewers with waste prohibited by health regulations.

While this system was in operation gas entering the oxide boxes contained from 20 to 40 grains of ammonia and 100 to 150 grains of hydrogen sulfide per 100 cubic feet. The ammonia content after the boxes varied from 2 to 14 grains per 100 cubic feet depending on operating conditions. There was a decided improvement in purification efficiency and a decrease in costs. Our bog ore-pine shavings mixture contained from 40 to 55% sulphur on the first fouling eliminating revivification and extra handling expense. We attributed the more satisfactory operation to maintenance of a continuously sweet condition in the boxes through intimate contact with ammonia.

Present Operation

We were so pleased with purification results obtained with the aid of ammonia that we retained this feature in a modified form when economic conditions were favorable for resuming manufacture of ammonium sulphate. As an aid to purification, ammonia and controlled quantities of air are added to the producer gas used for dilution at a point before the boxes.

Purification Equipment

Our purification equipment consists of three houses, operating in parallel, each of which consists of four boxes in series arrangement. Two houses are elevated and enclosed within a heated brick building. These boxes are 30′ x 40′ with provisions for two 3′ layers. The third house is partially buried with only a concrete slab around the walls to protect it from the weather. These boxes are 40′ x 50′ with two 5′ layers. Our total capacity is 137,600 cubic feet or 110,610 bushels which is an average of about eight bushels per M purified per day.

Purification Material

During the period covered by this paper our experience has been confined to the use of bog ore in the oxide boxes. Due to the difference in capacities of our houses it is necessary to vary the proportion of shavings to equalize differential pressures for the three parallel groups. Oxide for the eight smaller units is prepared on the concrete floor under the boxes by mixing two volumes of bog ore with one volume of shavings. Material for the larger outside boxes is prepared by mixing five volumes of bog ore with four volumes of shavings. This operation is carried out on the ground near the boxes by the steam crane.

We have not added lime to purification material since the first use of ammonia in 1931. Our experience indicates that it is not necessary if sufficient ammonia is added and the boxes are operated in a manner to prevent waste.

Operation of Boxes

Fresh batches absorb most of the available ammonia for a time after being placed in service. We have found it necessary to keep new boxes first in the series for about two weeks before they are sufficiently active for trace removal. This activity is not permanent, however, and must be aided by occasionally returning the box to the first position for further ammonia absorption. As gas passes through a series there is a progressive decrease in ammonia content. The rate of decrease depends upon the age of batches and the length of time since the previous rotation. Sometimes boxes act as accumulators and give off more ammonia than they receive until a new equilibrium has been established, usually a few days after switching.

While the saturators were by-passed there was an average of about 6 grains of ammonia per 100 cubic feet passing through the boxes. This was sufficient to keep the last box in the series active without rotation. At present with an average ammonia content of about 15 grains per 100 cubic feet entering the boxes, there is less than one grain passing through which is not sufficient for prolonged trace removal without rotation. We are now purifying gas containing from 300 to 400 grains of hydrogen sulfide per 100 cubic feet as compared to 100 to 150 grains per 100 cubic feet when the saturators were by-passed. This is more than twice the former removal aided by about one-half as much ammonia. To partially offset this disadvantage we increased the amount of air added to promote revivification in situ and aid trace removal.

When it becomes difficult to obtain clean paper tests and rotation does not afford relief we dump the oldest box in the offending house. Analyses show from 40 to 50% sulphur on dried samples and the batches are discarded.

Increasing Efficiency

Perhaps increased efficiency could be obtained with small amounts of ammonia if a source of supply were available at the inlet of each box where additions could be made as required. Our boxes are located at too great a distance from the ammonia still to investigate this theory. The chief advantage to be obtained would be utilization of newest boxes for trace removal by eliminating the necessity for rotation.

We have not correlated purification efficiency and gas temperatures sufficiently to state the conditions for best operation. We attempt to maintain an average inlet temperature of 80° to 90° F. This is lower than many operators recommend.

For the purpose of collecting data we chose No. 1 house as being the most satisfactory at this particular time. We expected to dump No. 1 box in this house early in the test period but unforeseen difficulties made this impossible. The prolonged use of this badly fouled box afforded an opportunity to show results under worse than average conditions. As indicated by the data this box was merely "among those present" throughout most of the test period. It was worthless as far as hydrogen sulfide removal was concerned

but it had the ability to act as a reservoir for ammonia, passing its excess along to the next box after switching.

HCN Removal

It has been suggested that use of ammonia for purification purposes might result in excessive amounts of both ammonia and hydrocyanic acid passing through into the distribution system, causing serious corrosion problems. We have made a limited number of tests to determine the HCN content of gas entering and leaving the boxes. Results were not conclusive but on the basis of information at hand we feel that 15 to 20 grains of HCN per 100 cubic feet of gas is a fair average at the purifier inlet. We have not found more than a trace at the purifier outlet although qualitative tests sometimes show it is definitely present in the sodium hydroxide solution used for absorption. The varying intensity of the blue qualitative color and its complete absence at times appears to verify our failure to find definite values on titration. This system has been in operation in some form since 1931 and so far no unusual corrosion problems have been reported by the company distributing gas purchased from us.

The Williams polysulfide process for the recovery of cyanogen, as described in the textbook "Modern Gasworks Practice" by Alwyne Meade, page 556, operates under conditions somewhat resembling our oxide purification. In the process ammonium polysulfide is formed by the reaction between ammonium sulfide and sulphur in spent oxide. A further reaction takes place between ammonium polysulfide and hydrocyanic acid to form ammonium thiocyanate. Perhaps a reaction of this type takes place in our purifiers assisting in almost complete removal of ammonia and hydrocyanic acid.

Conclusions

Our experience indicates that ammonia is a convenient and effective aid to purification. It keeps oxide sweet and active for longer periods of time than would otherwise be possible. It facilitates complete fouling without revivification, resulting in lowered purification costs and more continuous utilization of full oxide capacity. Excessive ammonia and hydrocyanic acid do not pass through into the distribution system.

AMMONIA & HYDROGEN SULFIDE TESTS

	NH_3 in Gas: Grains/100 Cu.Ft.						*H_2S in Gas: Grains/100 Cu.Ft.*				
		Tests on Outlet of Indicated Box						*Tests on Outlet of Indicated Box*			
Date	*Inlet Boxes*	*1st*	*2nd*	*3rd*	*4th*	*Order of Boxes in Series*	*Inlet Boxes*	*1st*	*2nd*	*3rd*	*4th Paper Test*
2/14/40	11.5	3.0	.2	.2	—	1, 2, 3, 4	—	—	—	—	clean
15	10.8	5.2	.4	.2	—	"	310	180	5	0	"
16	14.5	3.4	.3	.2	—	"	385	280	10	5	"
18	24.4	17.5	.9	.6	—	"	—	—	—	—	"
19	12.5	5.2	.4	.7	—	"	—	—	—	—	"
20	10.8	3.8	.4	.7	—	"	330	270	140	30	"
21	4.5	4.3	.4	.2	—	"	320	260	130	25	trace
22	19.5	—	—	—	—	4, 1, 2, 3	340	65	30	10	clean
23	12.0	4.5	6.0	1.0	—	"	300	55	20	10	"
25	10.7	1.0	2.9	1.2	—	"	—	—	—	—	"
26	11.2	1.2	2.5	1.0	—	"	275	75	35	10	"
27	13.6	1.6	2.8	1.1	—	"	315	85	45	10	"
28	12.5	—	5.0	1.7	.4	"	335	95	50	15	"
29	14.0	—	2.7	1.3	.5	"	—	—	—	—	trace
3/1/40	10.0	2.7	1.0	.3	—	1, 2, 3, 4	335	230	70	10	clean
3	14.2	5.2	1.3	.3	—	"	—	—	—	—	"
4	24.3	7.6	2.4	.6	—	"	380	300	120	45	"
5	28.3	7.4	2.2	1.0	—	"	400	315	110	50	"
6	10.5	3.9	1.3	.5	—	"	335	270	165	50	"
7	13.1	—	—	—	—	"	275	240	115	40	"
8	9.9	3.8	.3	.3	—	"	335	230	115	40	trace
10	15.4	—	6.3	3.3	.5	4, 1, 2, 3	—	—	—	—	clean
11	11.0	1.8	9.5	.4	—	"	340	80	60	15	"
12	—	1.1	5.0	.2	—	"	370	85	40	15	"
13	6.3	2.7	4.3	—	—	"	360	80	65	15	"
14	6.3	4.2	2.3	—	—	"	330	95	80	15	"
15	16.2	2.6	5.7	—	—	"	340	—	—	—	"
17	26.5	5.7	4.1	—	—	"	—	—	—	—	"
18	21.2	2.4	3.3	—	—	"	305	90	65	15	"
19	15.9	3.3	4.1	—	—	"	320	100	80	15	trace
20	14.3	3.6	3.8	—	—	"	295	95	70	10	clean
22	16.6	4.1	3.8	—	—	"	365	105	75	15	"
24	38.0	—	—	—	—	"	—	—	—	—	"
25	10.3	4.5	—	—	—	"	385	85	70	15	"
26	17.4	—	—	1.5	.7	"	355	80	65	15	"
27	5.3	—	—	3.6	.7	"	370	70	60	15	"
28	25.1	—	—	3.2	—	"	375	65	55	15	"
Average	15.0	4.2	2.9	1.0	.6		339	148	72	19	clean with 4 exceptions

W. K. Allebach Dies

WILMER K. ALLEBACH, superintendent of the Camden coke plant of Public Service Electric and Gas Company of New Jersey, died on August 18 of a heart ailment. Mr. Allebach was 46 years of age.

Only last July employees and executives of the coke plant had honored Mr. Allebach at a testimonial dinner in recognition of his 25 years' service with the company. He joined Public Service as a draftsman and had been superintendent of the coke plant since August 1934.

He attended Drexel Institute and was employed by a Philadelphia engineering firm before joining Public Service. He was a member of the American Gas Association.

Book Review

Purging of Gas Piping and Gas Apparatus. Published by American Gas Association, 420 Lexington Ave., New York, N. Y. 40 pages. 50 cents per copy to members, $1.00 per copy to non-members of A. G. A.

(Reviewed by R. S. McBride for *Chemical and Metallurgical Engineering.*)

This document gives procedures recommended by the technical committees of American Gas Association for safe operation when purging or placing gas piping appliances into service or removing them from active service. The precautions described are a valuable guide to safety in similar operations in many types of chemical engineering equipment containing explosive or flammable gas or gas mixtures. Chemical engineers will do well to place a copy of the booklet in the hands of their operating superintendents and foremen who have any occasion for carrying out such operations.

An analogous publication was issued some time earlier by the same committee giving the procedures recommended by the A. G. A. for the "Purging of Gas Holders." The technic then recommended is analogous to the present operating methods but more readily adaptable to use with gas storage equipment. The earlier pamphlet is also available at the same price as the more recent one.

Standards for Cast Iron Pipe Forged Over Long Period

C. C. SIMPSON, chairman of the American Gas Association Subcommittee on Cast Iron Pipe Standards, has distributed copy of a draft of proposed specifications for Pit Cast Iron Pipe for Gas.

Mr. Simpson, who is engineer of distribution of the Consolidated Edison System, New York, for many years has served the American Gas Association as secretary of the American Standards Association Project A-21, Cast Iron Pipe and Fittings. This project is sponsored jointly by the American Gas Association, American Society for Testing Materials, American Water Works Association and the New England Water Works Association.

Mr. Simpson reports that because the differences between the standard gas bell for bell and spigot pipe as established in American Gas Association Specifications (1929) and the standard water bell as established in Specifications A-21-2-1939 of Committee A-21, American Standards Association, are principally in the shape of the lead crease and the width and depth of the joint, the committee feels that with slight modifications to both the gas and water bells a standard type of bell might be designed suitable for both uses. Reactions and suggestions are requested.

Standardization Progress

The record of pipe and joint standardization is interesting and instructive, this standardization being initiated at the November 20, 1890, meeting of the Society of Gas Lighting held in Newark, N. J., where Alexander H. Strecker, engineer of the Citizens Gas Light Company of Newark, presented a paper on standard castings. As a result of the ensuing discussion a committee was appointed by the chairman to report on the subject at some future time.

During the year 1891 the Committee on Standard Castings reported progress at the January and May meetings. At the November meeting the report of the committee was presented and on motion was accepted; it was formally adopted at the meeting held January 21, 1892, at the works of the Nassau Gas Light Company, Brooklyn, New York. This covered bell and spigot and flanged pipe and fittings from 3-inch to 30-inch with fairly complete dimensions of pipe and fittings and weights of pipe.

In October, 1898, the American Gas Light Association adopted the Standard Gas Works Castings of the Society of Gas Lighting. This covered bell and spigot and flanged pipe and fittings from 4-inch to 30-inch, gave weights of pipe somewhat greater than those in the 1892 standard, and weights of fittings.

Following suggestions looking toward greater uniformity of the pipe standards then in use made in his presidential address by the late George G. Ramsdell at the twenty-eighth annual meeting of the American Gas Light Association, held in October, 1900, a committee was appointed with the late W. R. Beal as chairman. As a result, in October, 1905, a more elaborate standard for bell and spigot and flanged pipe and fittings was adopted by the American Gas Light Association. Upon merger of the American Gas Light Association and the American Gas Institute, the latter continued the work of improving this standard and in October, 1911, adopted a standard for "Bell and Spigot Pipe and Special Castings" which gave dimensions and approximate weights for bell and spigot pipe and fittings for sizes 4-inch to 48-inch with dimensions based on Class A water pipe of the American Water Works Association standard.

In October, 1913, the American Gas Institute adopted a standard for "Flanged Pipe and Special Castings" which gave dimensions and approximate weights for flanged pipe and fittings from 4-inch to 48-inch, with dimensions based on Class A water pipe of the American Water Works Association.

The three specifications just mentioned, issued by the American Gas Institute, namely the 1911 standard for bell and spigot pipe and special castings, the 1913 standard for flanged pipe and special castings and the 1913 standard specifications were all adopted subsequently by the American Gas Association, and issued as its Standard Specifications for Cast Iron Pipe and Special Castings. Since that time there have been several revisions, the latest in December, 1929, and all of them slight except for the extension to 72-inch of the flanged standards in pipe, bends, and a few branches.

In 1926 the American Gas Association joined in the creation of Sectional Committee A-21 on Specifications for Cast Iron Pipe and Special Castings. This committee was organized under the rules of the American Engineering Standards Committee, now the American Standards Association.

Space does not permit inclusion of the names of famous engineers who have contributed so much of their time and experience throughout the entire history of standardization work resulting in innumerable advantages to the present and future users of cast iron pipe.

Gas Ready To Speed Arms Production

A RECENT development in the use of city gas which has wide application in the production of armaments for national defense was described in a paper on "City Gas for Special Atmospheres" by C. George Segeler, American Gas Association, and C. R. Cline. A. G. A. Testing Laboratories, presented at the September meeting of the American Chemical Society.

This development is the use of gas as a chemical agent for the purpose of improving the quality of steels and other metals, and particularly to produce the bright finishes demanded by many fabricating processes. These results are brought about by reforming, cracking and otherwise modifying city gases, of which there are more than thirty distinct types in use in various parts of the United States. Research now concluded by the American Gas Association outlines the details of the methods of modifying gases for these purposes.

In its use as a chemical agent, the gas is not burned but is used literally as atmosphere. It takes the place of air in the huge ovens making steel, brass and bronzes for armaments.

These atmospheres are rich in hydrocarbons. Carbon monoxide, hydrogen, ethane, methane and other hydrocarbons both protect the forming metal and combine with it in small amounts to add special strength, bright finish or good wearing quality.

During the World War, Messrs. Segeler and Cline point out, the moving, gas-fired oven solved a critical munitions-making problem. "Today," it is stated, "a second opportunity looms. The special atmospheres are ready to speed up production by eliminating time-consuming, inefficient steps required in the past to produce the quality needed for military use."

New West Coast Gas Field Opened

THE Pacific Gas and Electric Company will shortly have an additional supply of natural gas to supplement the tremendous quantities it pipes from Kettleman Hills, at the southern end of the San Joaquin Valley, and from other fields near Rio Vista, Solano County, and in the Sutter Buttes, Sutter County.

This new gas source is a recently developed field at Fairfield Knolls, Yolo County, about eight and a half miles northwest of Davis and nine miles southwest of Woodland. At present there are two wells, both owned by the Standard Oil Company.

Natural gas from Fairfield nolls will be used to supplement the supply now brought from the Rio Vista field to serve communities in Yolo County. To this end, the P. G. and E. plans to construct eight miles of 4½-inch pipeline from the wells to the main running between Davis and Woodland. The project will cost $41,400.

Laboratories

N. T. Sellman, *Chairman, Managing Committee*
R. M. Conner, *Director*
W. H. Vogan, *Supervisor, Pacific Coast Branch*

A. G. A. Requirements Accepted as American Standard

ON July 15, three sets of requirements sponsored by the American Gas Association were accepted as American Standard by the American Standards Association. These include recommended revisions to the current American Standard Approval Requirements for Hotel and Restaurant Ranges, Z21.3-1938; recommended revisions to American Standard Approval Requirements for Central Heating Gas Appliances, Z21.13-1940, which become effective on January 1, 1941; and a new set of requirements for deep fat fryers, entitled American Standard Approval Requirements for Hotel and Restaurant Deep Fat Fryers, Z21.27-1940. This action supplements an already aggressive record for 1940 in which ten sets of standards were adopted as American Standard on February 23, 1940, to become effective on January 1, 1941. These additional standards likewise become effective at that date.

Unit Broilers Covered

Advantage was taken in revision of the current requirements for hotel and restaurant ranges to extend its scope to cover unit broilers. For this reason, its title was revised to American Standard Approval Requirements for Hotel and Restaurant Ranges and Unit Broilers, thus indicating its enlarged scope. In bringing these requirements up to date, recommendations of the Subcommittee on Test Gases and Test Pressures were incorporated.

One of the principal changes was provision for testing such equipment for use with mixed gases which are being distributed over an increasingly larger area. Likewise, the former section covering performance with use of propane gas was extended to cover all liquefied petroleum gases. A new section was added covering heating capacity of hot top ranges which specifies a minimum speed of heating for such tops.

Another addition of interest both to manufacturers, as well as consumers, is provision for a permanent marking of models constructed with detachable legs or bases, the removal of which may affect operation, with the following statement: "For Use Only with Legs or Ventilated Base." This will enable consumers to recognize proper installation of this type of equipment for satisfactory performance.

In developing equitable requirements for deep fat fryers, the supervising committee felt that their scope should be limited to such equipment sold as package units for hotel, restaurant, club, or similar purposes rather than for larger commercial undertakings which are usually engineered for a given operation. Consequently, capacities of deep fat fryers covered by these new American Standards are limited to a maximum of 300 lbs. of cooking fluid.

These new standards are the result of a considerable amount of study and investigation of construction and performance of contemporary models conducted at the A. G. A. Testing Laboratories. In addition to providing complete constructional specifications to insure rigidity and durability, performance tests were designed to simulate the most severe conditions under which this type of equipment would operate in service. Of particular interest to users of deep fat fryers are limitations on temperature rise of heated surfaces in contact with cooking oil, thereby eliminating unnecessary scorching and spoilage of the cooking fluid. Likewise, temperatures near the bottom of crumb receptacles, which are a required part of all deep fat fryers, must be at least 100° F. lower than top temperatures of the cooking fluid, thus further preventing its contamination. In addition, heating capacities must be such as to develop adequate frying temperatures within a given time from a cold start.

Floor Furnace Changes

To permit Laboratories' approval of wall-register type floor furnaces, a type recently developed to meet consumers' needs in the West and Southwest, it was felt advisable to incorporate in the American Standard Approval Requirements for Central Heating Gas Appliances such provisions which would adequately cover their safe performance under the installation conditions for which such types of units are intended. Therefore, the section on wall, floor, and flue temperatures was revised to permit testing of wall-register type floor furnaces. No part of the furnace casing, grille, or parts of the register in contact with wood or combustible wall materials may exceed a temperature of 90° F. above room temperature after operating for 2 hours at a rate 22½% above normal input rating.

Other revisions deemed necessary for inclusion in the central heating requirements, which become effective on January 1, 1941, are constructional provisions for preventing condensate from entering pilot lines and their exposure to damage hazards. In addition, doors are made mandatory to cover openings for replacement of air filters for forced-air furnaces. Unless this door is designed to close by gravity or spring tension, the following statement must be permanently marked thereon: "This must be closed during operation of the furnace." This specification will assist consumers in using such equipment properly and to their greatest advantage.

Although these requirements become effective January 1, 1941, manufacturers desiring to do so may submit their equipment for test for compliance therewith in advance of this date. For additional information on these standards, inquiries should be addressed to the American Gas Association Testing Laboratories, 1032 East 62 Street, Cleveland, Ohio. Printed copies of these standards are available at nominal cost.

Cleveland Laboratories Staff Outing

ON August 16, the A. G. A. Testing Laboratories staff of engineers and office personnel held its thirteenth annual picnic at Pine Ridge Country Club, located near Cleveland. Approximately 200 persons attended including the wives and families of the staff members as well as a number of manufacturers who were visiting the Laboratories at the time. It represented the largest social affair ever held by the Laboratories' staff. Everyone attending agreed that it was a most successful outing.

An interesting program of activities was provided. For those who did not play golf in the morning, the swimming pool and tennis courts were available. After an informal picnic lunch, the annual baseball game between the Research and Testing Departments was held. "Gene" Milener, from Headquarters staff who was visiting the Laboratories, refereed the game, the Research staff winning with an overwhelming score of 20-7.

Following the baseball game, the entire party participated in swimming matches. Numerous races, including an exhibit by Madam Lazonga, were held. Both the staff and visiting manufacturers were greatly surprised to find that Madam Lazonga was none other than our Assistant Chief Testing Engineer, K. H. Flint. A group of real old-fashioned picnic games and a tennis tournament closed the activities for the afternoon.

A buffet dinner was served at 7:00 P.M. In line with the general spirit of the day, after dinner speeches were very brief. R. M. Conner, Director of the Laboratories, com-

plimented the staff on their cooperation which made this event so successful for everyone. A serious note was contributed by Mr. Milener who complimented the Laboratories' staff and attributed the progress of the Laboratories during the past fiscal year to the same spirit of cooperation displayed at this outing. The program was concluded with an informal dance to the accompaniment of a nine-piece orchestra, in the ballroom of the country club.

Revised Gas Valve Specifications

FOLLOWING the customary procedure begun with the establishment of the Testing Laboratories' standardization and certification program, Recommended Revisions to American Standard Listing Requirements for Gas Valves Z21.15-1934 were distributed to all member gas companies and interested manufacturers for their criticism early last month. This affords the industry an opportunity to study these proposed revisions and present its comments before their final adoption. All criticisms and suggestions will be thoroughly considered by the Subcommittee on Listing Requirements for Gas Valves, which is sponsoring these standards at the time of its next meeting.

Of particular interest in these recommended revisions is the enlarged scope of this American Standard. In addition to gas burner valves, formerly covered, it is now proposed to extend these requirements to include all types of gas valves commonly used with domestic gas equipment. They now include manual main gas-control valves which are placed in a gas line for the purpose of completely turning on or shutting off the gas supply to the appliance except to pilot or pilots which are provided with independent shut-off and pilot valves. As a result, the title of these requirements has been changed from gas burner valves to gas valves.

Among the important changes proposed in the specifications are modification in minimum dimensions and tolerances required in the construction of these valves. In addition, a new strength test assuring rigidity of construction, as well as to prevent leakage under conditions of applied stresses has been incorporated. These revisions reflect the general improvements made in production methods for all types of accessories. Consequently, it is expected that they will be favorably received by the industry.

New Data on Furnace Atmospheres Is Now Available

By J. P. LEINROTH

Member, Committee on Industrial Gas Research, Public Service Electric Gas Co., Newark, N. J.

THE American Gas Association through its Committee on Industrial Gas Research headed by F. J. Rutledge, vice-president of the United Gas Improvement Company, for a number of years, has been investigating many phases of industrial gas combustion with the object of providing useful data which might be helpful in furthering the use of gas for industrial processes. From time to time, summaries of these studies are published and distributed to the industry. Bulletin No. 11, "Composition of Furnace Atmospheres Resulting from Partial Combustion of Gaseous Fuels," is the latest investigation conducted at the Laboratories. This publication summarizes all preliminary phases of this study, Project No. 36, and should be of considerable value to the industry.

The new bulletin embodies data obtained from over 2500 observations of flue gas temperatures, gas rates, aerations, and more than 750 complete flue gas analyses. Likewise, it contains original data showing relative concentrations of different flue gas constituents resulting from combustion of three different fuel gases encompassing nearly the entire range of variations in typical city gases when the air supply was varied from that required for complete combustion to the lowest which would support combustion.

Special sections are devoted to discussion of carbon monoxide-hydrogen ratios, carbon monoxide-carbon dioxide ratios, and occurrence of free oxygen in flue products. Effects of both combustion wall temperature and flue gas temperature on resulting constituents are also noted, together with the relationship between composition of fuel gas and resulting flue products.

In addition, data are presented showing effect of air supplied for combustion on the volumes of the various flue constituents per cu.ft. of gas burned, maximum flue gas temperatures developed, amount of heat in flue products at various temperatures, amount of gas burned per unit of combustion space, and flame length resulting under these conditions. It is interesting to report that approximately 5 million B.t.u. per hr. per cu.ft. of combustion space could be burned with a minimum amount of air required to support combustion of natural gas, and about 4 million B.t.u. per hr. per cu.ft. of combustion space for manufactured gas under the same conditions. A practical interpretation of these observations, as well as a discussion of methods of producing controlled furnace atmospheres of desired composition, together with such relating factors as design of burner and combustion sample for operation under these reducing conditions rounds out the data presented.

Copies of Bulletin No. 11, "Composition of Furnace Atmospheres Resulting from Partial Combustion of Gaseous Fuels," may be obtained from the American Gas Association Testing Laboratories, 1032 East 62nd Street, Cleveland, Ohio, or from the American Gas Association Headquarters, at nominal cost.

Annual Inspection Program Now Under Way

ON October 1, the largest annual inspection program ever conducted by the American Gas Association Testing Laboratories will be under way. With nearly 18,000 different models of gas appliances and accessories currently listed in the Directory of Approved Gas Appliances and Listed Accessories, the magnitude of this program can readily be appreciated. Extending from coast to coast and from Montreal, Canada, to Dallas, Texas, more than 500 producers of gas equipment will be visited before the end of the year. Approximately ¾ of this number will receive representatives from the Cleveland Laboratories, and the remainder from the Los Angeles Branch. An augmented staff of 19 engineers will be engaged in this activity.

These annual inspections, as they are commonly termed, are for the dual purpose of ascertaining whether production models of approved appliances and listed accessories conform with those originally submitted to the Laboratories for test, and to afford manufacturers the opportunity of obtaining approval of products that incorporate similar construction to previously tested basic models. Supplementing these annual inspections, unannounced and special inspections are conducted during the year in manufacturers' plants, dealers' and jobbers' warehouses and sales floors, and of late, an increasing number in consumers' homes.

It is gratifying to report that the Laboratories' representatives have found manufacturers cooperating whole-heartedly with the Laboratories' program. In relatively few cases, changes usually of a minor nature have been found necessary. Prompt steps have been taken for their correction. Both the number and thoroughness of inspections have been progressively increased during the past several years, this resulting in assured maintenance of quality of approved equipment as well as greater consumer satisfaction.

As an indication of this increased program, it is interesting to note that some 30 companies submitted their equipment for test to the Laboratories for the first time during the past year. Factory and dealer inspections completed during the previous year show an increase of nearly 10%, much of which is due to the greater number of companies now manufacturing certified products.

Natural Gas in Appalachian Area

(Continued from page 334)

heavy line is the composite of the whole.

West Virginia and Kentucky have in certain years reported more gas treated for gasoline than produced. In the case of Kentucky, it is quite probable that some imported gas was treated. In West Virginia it may be explained by gas used for repressuring and recycling in the secondary recovery of oil. Such gas would probably be treated for the recovery of gasoline, but would not appear in the production figures. In some years the underground storage of gas will account for part of the discrepancy.

Less Gasoline Recovered

The surprising trend is the decrease in the percentage of gas processed for gasoline recovery. A part of this decline may be due to the discovery of greater quantities of "dry" gas, but the chief reason appears to be the low price and restricted market for natural gasoline. Present demands are for gasoline with higher and higher octane ratings, while as a rule, most natural gasoline has a low octane number. Except for a marked improvement in the demand for natural gasoline, it may be expected that the *percentage* of natural gas produced in the Appalachian area, treated for the recovery of gasoline, will continue to decline.

A new development in recent years is the growing liquefied petroleum or bottled gas industry. This industry is based primarily on the propane-butane fractions which occur in varying quantities in natural gas. These are high B.t.u. gases and can be used for fuel either alone or blended with manufactured gas. In the United States the use of these gases is rapidly increasing. Unfortunately, statistics on these gases are not segregated by areas, hence the production figures in the Appalachian area are not available. Some companies in the Appalachian area, however, are active in this branch of the industry.

The Appalachian area has again pioneered in another type of storage and transportation of natural gas. The Hope Natural Gas Company, with headquarters at Clarksburg, W. Va., has found at their Cornwell experimental station, that it is possible to liquefy, at very low temperatures, all fractions of natural gas. The results of their experiments are to receive practical application as shown by their announcement to construct a large liquefaction plant at Cleveland, Ohio. Such a plant is the equivalent of increasing the size of the pipeline supply to that City. Its possible value to meet peak load requirements is obvious.

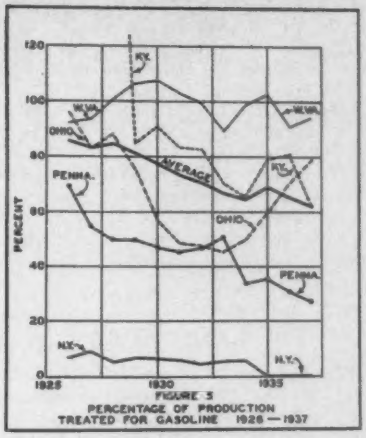


FIGURE 3
PERCENTAGE OF PRODUCTION TREATED FOR GASOLINE 1925 — 1937

The storage of gas during periods of low demand in underground reservoirs was first successfully demonstrated near Pittsburgh. This method of storage is now in use in many parts of the United States.

Natural gas as a raw material for the manufacture of synthetic chemicals is yet in its infancy, but already the list of products that can be synthesized from it is long and imposing. It includes products ranging from explosives to synthetic rubber, with numerous solvents, plastics, etc., in between. In fact, the use of gas in the manufacture of explosives and synthetic rubber has recently made news in connection with the rearmament program.

In conclusion, it may be said that the natural gas industry in the Appalachian area will continue to be a large and important one, and even more interesting in the future in its many phases of development, than it has been in the past.

Acknowledgments

To E. T. Heck, Assistant Geologist, the writer is indebted for aid in the preparation of this paper, especially the gathering of statistics and preparation of comparative curves.

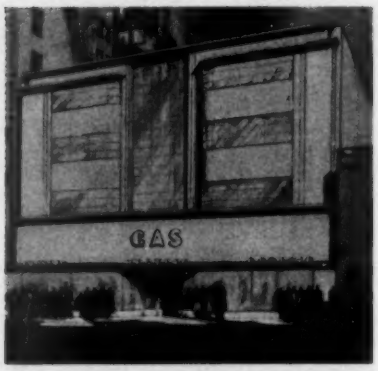
New Natural Gas Wells

THREE new natural gas wells were drilled in the New York-Pennsylvania area in early September, according to a report from Wellsville, N. Y. Reserve supplies of natural gas in the district increased by nearly 12,000,000 cubic feet daily, the production survey indicated. This survey showed 19 wells then drilling, 14 in New York, 4 in Pennsylvania and one in Ohio near the Pennsylvania line.

Gas Measurement Short Course Directors

Directors of the Appalachian Gas Measurement Short Course photographed at West Virginia during the course. Left to right, back row: J. E. Overbeck, W. A. Staab, F. N. Wolf, A. F. Kraus, R. O. Borden, E. M. Lockwood, Karl K. King, J. W. Allison, T. K. Spalding, Lawrence Hunter, Alex M. Brooks, H. J. Wagner, and D. L. McElroy. Front row: G. R. Spindler, W. A. Ehlers, R. W. Hitchman (General Chairman), Allen D. MacLean, B. P. Stockwell, and G. W. Harr

New Gas Building Begun



Architects drawing of the Southern California Gas Company's proposed four story class "A" building to be erected at 820 Flower Street, Los Angeles, just south of the company's present height limit building at 810 South Flower Street. Scheduled for completion early next year, the new structure together with land and equipment will cost approximately $300,000

War Hinders London Trade Press

CENSORSHIP and other wartime restrictions have laid a heavy hand on the work of gas trade publications in England in addition to hindering trade association and other cooperative undertakings. Interesting happenings at gas works cannot be discussed. The press of war activity, conscription and other matters have seriously interfered with the normal flow of contributions to these publications.

In view of these circumstances, at least one editor, W. R. King, of *The Gas Journal*, 11 Bolt Court, Fleet Street, London, E.C. 4, has written that original contributions from any member of the gas industry in this country would be welcome.

Texas Promotions

APPOINTMENTS of George W. Martin as general superintendent and Fred A. Garrett as purchasing agent and building manager for the Dallas Gas Company and County Gas Company were announced recently by R. G. Soper, president and general manager. Mr. Martin succeeds R. M. Redding who resigned August 1 because of ill health.

New York Sets Pace in Big Gas Jobs

NEW YORK is setting a fast pace in the installation of big gas-using jobs. Recently announced by the Consolidated Edison Co. of New York, Inc., were the following additions to the gas lines:

Thirty-two million cubic feet of gas per year will be supplied to the City for cooking at the new Vladeck Houses project.

Blanchard Press, Inc., will use an additional 7,300,000 cubic feet annually at 418 West 25th Street.

Marcus & Frucht have applied for 3,000,000 cubic feet per year for a new restaurant at 2241 Broadway.

More than a million cubic feet annually will be used for heating at Rosenberger-Simon Corp., 46 West 29th Street.

Pepsi-Cola Company will use 6,000,000 cubic feet annually in a drying oven.

The King's English

THE best a dog can do is to say: "WOOF." But he can say it to mean most anything. He can bark joyously as he greets you. He can snarl when his food is endangered. He can growl at a stranger. He can express pain or disappointment. The dog does it by the tone of his bark.

Now if you could add a vocabulary to the dog's ability of expression there never would be a question as to his meaning. We can talk and yet so often our meaning is misunderstood. The reason is just carelessness. Add flavor to your speech by expression. Make your words sound so as to express what you mean. In addition . . . use the right words. The King's English is an expressive language. Make use of it:

When a customer is indignant about a rule don't express surprise and thereby indicate that the customer is in the wrong. Say: "Your point of view is natural, but . . ." or say: "I can appreciate why you thought that . . ." You can REQUIRE a deposit, but the impression on the customer will be better if you REQUEST one. If the customer's service was turned off because of non-payment of a bill you can say "I will be glad to have your service turned back on" and then request a payment, or you can request a payment first and not make near the impression of service using practically the same words.

Yes, indeed. Personality makes the difference. If all it took was just words, a phonograph record could interview customers. But it takes tact and patience; it takes a sincere desire to serve and an understanding of human nature to build good-will. Try it.—*The Gas Flame.*

Personnel Service

SERVICES OFFERED

Young gas **distribution engineer** feels that he has served his apprenticeship as assistant superintendent for nine years in high, medium and low pressure distribution of manufactured gas. Now employed in a district maintaining about 90,000 meters. Married, fair education. (33) **1383.**

Manufacturers' representative having excellent contacts among domestic, commercial, and operating departments of Metropolitan New York Utilities would welcome the opportunity to promote the sales of gas consuming, labor and time saving specialties. **1386.**

Sales Executive—property manager. Twenty-three years' experience in the utility business plus three years' sales promotion work with one of the largest gas appliance manufacturers. Outstanding record in merchandising and sales management. Experienced in meeting electric competition; well qualified in building good will. **1387.**

Professional **Mechanical Engineer,** university graduate. Nine years' experience in high and low pressure distribution. Three years' experience in banking and real estate appraising. Experienced in manufactured and natural gas. Positions held: Chief draftsman, cadet engineer, appliance service manager and assistant engineer. **1389.**

Gas Appliance Engineer desires opportunity with gas company, or manufacturer where training and experience can be used to advantage. Three and one half years' experience with outstanding manufacturer, all phases of testing, design and development of gas appliances. Thorough knowledge of combustion, air flow, heat transfer, safety controls. Salary moderate. **1390.**

Industrial Gas Engineer, 10 years industrial and house heating experience with manufactured and natural gas. Surveys, preparation of rates, sales manager of small plant. Also 10 years construction experience. Graduate C. E. Desires position in industrial or house heating. (51.) **1391.**

Engineer with exceptionally well rounded operating experience in operation of water gas, retort and coke oven plants; construction and operation of distribution systems; design and manufacture of gas plant equipment and in rate, valuation and plant record work. Employed but desire position with greater possibilities. (45.) Technical graduate. **1392.**

SERVICES OFFERED

Advertising Service Man, experienced since 1920 in gas and electric promotions east and middle west on customer and employee relations, utility and appliance sales as advertising manager, writer, house organ editor. No miracles, but complete, practical detailed productions. Fee basis or moderate salary. Invites correspondence or interview New York City. **1393.**

Engineering graduate (35), married, having twelve years of varied experience in design, manufacture, erection and operation of gas plant equipment and in supervision of **plant operation,** desires supervisory or technical position with company producing blue gas uncarburetted or carburetted with light or heavy oil. Available at once. **1394.**

Patent agent and **Research Engineer,** 12 years domestic and foreign patent experience, languages; specialize gas, coke ovens, industrial furnaces, burners, gas production, distillation, carbonization, cracking, refractories. Desires responsible position in corporation, or to organize corporation patent department, or manage all patent work for small corporation. **1395.**

May I help you? Have exceptional record as new business head, writing good will and merchandising copy. Excellent results from public and employee relation work. Specialized in water heating, obtaining very high saturation with sound and unique plans. Have spent the last seven months researching water heating by other fuels. **1396.**

POSITIONS OPEN

Salesman to represent manufacturer of well accepted gas fired bake ovens in greater New York and surrounding area establishing dealer outlets through supply houses and gas utilities, and selling direct to bakers, hotels, etc. Man with experience in selling bakery equipment preferred. Remuneration on straight commission basis. Exclusive territory protection. State detailed qualifications in application. **0351.**

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